



FRIDAY, APRIL 30, 1880.

The Wheeled Scraper or Self-Loading Cart.

This useful implement is intended and employed for moving earth short distances, as in grading roads, excavating for buildings, reservoirs, etc. The ordinary road scraper,

half of what it will cost to do it with wagons and shovels, besides enabling contractors to do work which it would be impossible to have done when labor is difficult to get."

These scrapers have been used for grading on the Chicago, Burlington & Quincy Railroad, the Atchison, Topeka & Santa Fe, the Burlington & Missouri River in Nebraska, the Chicago & Alton, the St. Louis, Kansas City & Northern, and other railroads. It should be added that three different sizes are made.

To prepare the ground for the scraper it must, however, first be loosened with a plow. The manufacturers, therefore, make three sizes of heavy and strong plows, which are espe-

Contributions.

Carelessness in Enginemen.

TO THE EDITOR OF THE RAILROAD GAZETTE:

There is no branch in railroading where there is so much ignorance as in the management of locomotive engines by the drivers. The amount of water carried in the boiler while running has attracted my attention lately. The height that the so-called "good runners" carry the water is generally four gauges; now the gauges are about three inches apart, and four in number, the lowest being about three inches

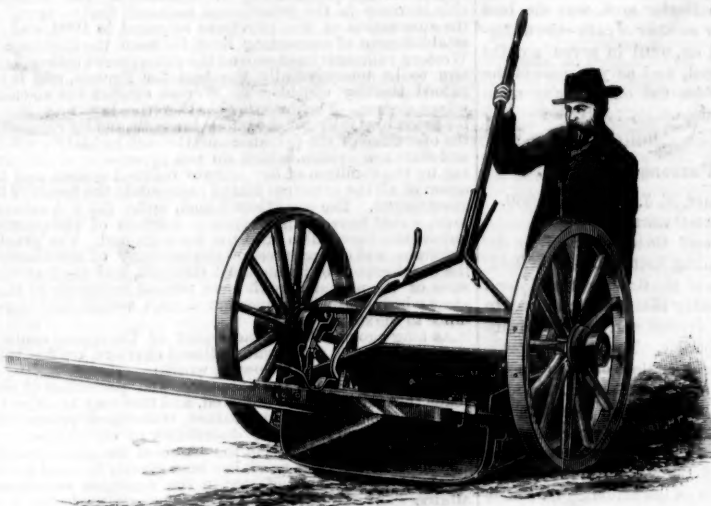


Fig. 1.

as most of our readers know, consists simply of a large shovel or scoop, to which a pair of horses is harnessed, and which is then drawn through the earth previously loosened by a plow. The shovel or scoop is then filled with earth, and is then dragged to its destination and there dumped.

The wheeled scraper, which is illustrated by our engravings, consists of a similar shovel or scoop made of steel, which is mounted on a pair of wheels, as shown in figs. 1, 2 and 3.

Fig. 1 represents it in its position for loading, and also the construction of the scoop or box for holding the earth. This part is now made of one piece of steel plate, instead of separate pieces flanged and riveted together, as it was formerly made. The improved form is stronger and more durable than the old style, and is much easier to load.

Fig. 1 also shows the construction of the hand lever and its connection with the scoop, and the manner of raising and lowering the latter.

Fig. 2 represents the scraper raised from the ground and locked by a latch connected with the hand-lever. In this position the scoop and its contents can be hauled away in the wheels to the place to which the earth is to be removed.

Fig. 3 represents the position of the scoop when dumped. This is done by simply unlocking the hand-lever and throwing it up as represented. It can then be locked in this position and hauled back to be reloaded. The processes of loading and unloading are both performed without stopping the team, the same as with drag scrapers, thus effecting a great saving of time in comparison with that required to do such work with wagons and shovels. Minor improvements have also been made in the method of supporting these scrapers and in the appliances for handling them, which add very materially to the ease of doing the work.

As will be seen from the engravings, the scoops are attached to an iron frame, which is suspended to an iron axle, and when loaded the whole weight is carried on the two wheels, and it is therefore much easier to move than a drag-scraper without wheels. An ordinary team will handle one of the former containing half a cubic yard of earth with greater ease than it will a drag-scraper with an eighth of a yard, and will make as many trips with the one as the other. The manufacturers say that "on hauls from 50 to 600 ft., it will move earth so much cheaper than by any other known method that it is placed beyond comparison with any other machinery or appliances in use. On hauls of 600 to 1,000 ft. earth can be moved with the largest sized scrapers at one-

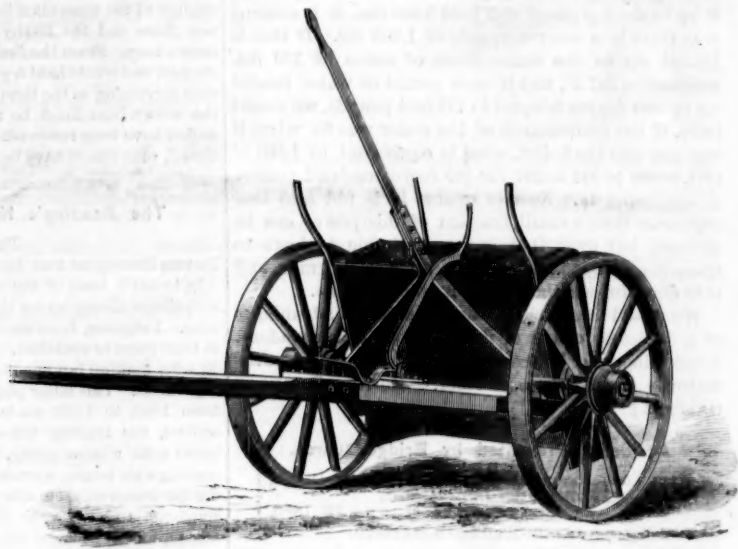


Fig. 3.

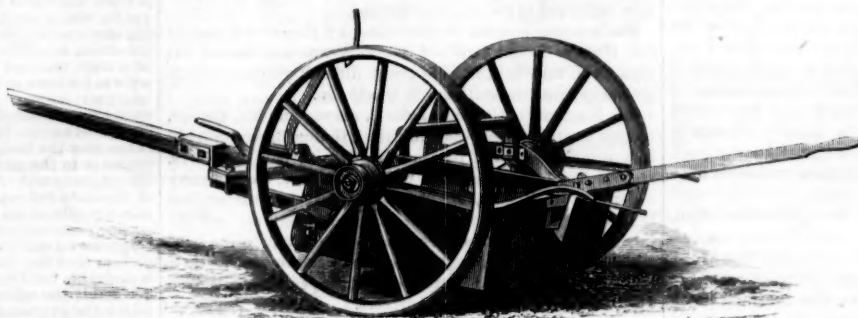


Fig. 2.

THE STUBBS-SCHULTZ WHEEL SCRAPER, OR SELF-LOADING CART.

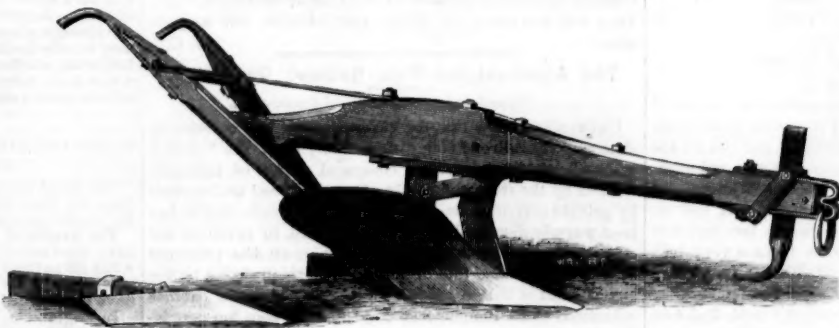


Fig. 4.

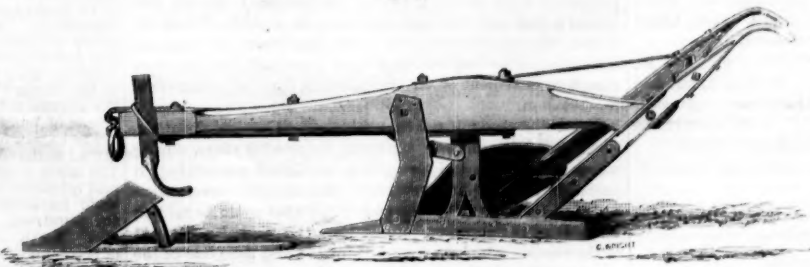


Fig. 5.

RAILROAD PLOWS.

cially adapted for such work. Figs. 4 and 5 represent both sides of one of these, which are called "railroad plows." The different sizes are so strong that from four to ten horses can be used with them. The beam is of large size—four inches thick and nine inches deep. An extra bottom is furnished with each plow, and as the cutter is reversible, in reality two duplicates are furnished of those parts most subject to wear.

These implements are manufactured by the Western Wheel Scraper Company, whose address is Mount Pleasant, Iowa.

—Mr. Jonathan Camp, an old and respected citizen and long a director of the Danbury & Norwalk Company, died at his residence in Norwalk, Conn., April 21, aged 79 years.

above the highest heating surface, thus giving twelve inches to the top gauge, so that they carry water at least twelve inches above the top of the fire-box. When the water is carried so high the steam space is contracted, and the generation of steam retarded. The fires, therefore, have to be urged violently, thereby increasing the consumption of coal, and causing the boiler to "prime" and get rid of its overburden of water, to the great danger of the machinery. The way that one driver that has come under my notice carries the water is absurd. He waits until the steam just comes out of the top gauge, and then he thinks the water is dangerously low, and puts the pump on and lets it run for some time, until he judges it is high enough; how high he does not know, as there is no gauge on the steam dome. Any one who has even a limited idea of the subject will know how much harder it is to generate steam where the water is high than where it is reasonably low. Six inches of water over the top of the highest heating-surface is sufficient for any well constructed boiler; but instead, we have about twelve—six inches worse than useless. Their ideas on firing are equally incorrect, judging from the orders I heard given: "Put coal in as it comes, as long as you can get it through the door." The door was about sixteen inches in diameter. We might then fill up the whole grate surface with a dozen big lumps, which would be equivalent to putting the fire out. These and many other facts too numerous to mention may give an idea of how locomotives are managed. The road on which this kind of firing is done is one of the finest in the world, and if such work is allowed here, what must it be on other roads? Were the enginemen better educated concerning their business, and more attention paid to these apparently small things, there would be an immense saving in the annual coal bills and a great increase in the power of the engines. But is such ignorance to be wondered at? How can they know better? The best of the men are the sons of farmers, who came straight from the plow, and after firing for a year or so under men whose ignorance in engineering is only exceeded by their own, they are put to drive an engine! In this way the gross stupidity that has existed for years continues, and will continue until they have suitable training, and competent examiners appointed for engine-men, and certificates granted.

CERTIFICATE 33,102.

ALTOONA, Pa., March 30, 1880.

[Probably our correspondent will modify his views somewhat after he has had more experience in run-

ning a locomotive. That "it is much harder to generate steam where the water is high than where it is reasonably low," does not seem so obvious to us as it does to the writer of the above. It is true that it takes a longer time to heat a large body of water than a small one, but after it is heated it is not plain why it is not then just as easy to generate steam in the one case as in the other, with the added advantage in the former of a considerable amount of reserve power stored up in the form of hot water. If a locomotive boiler filled to the lower gauge will hold 4,000 lbs. of water, and by filling it up to the top gauge will hold 5,000 lbs., it is evident that there is a reserve supply of 1,000 lbs. If this is heated up to the temperature of steam of 130 lbs. pressure = 347.2° , and if each pound of water heated up by one degree is equal to 772 foot-pounds, we would have, if the temperature of the water was 60° when it was put into the boiler, what is equivalent to $1,000 \times (347.2 - 60) \times 772 = 221,718,400$ foot-pounds of reserve power stored up. Now of course it is not said that any more than a small fraction of this power can be utilized, but even that is very desirable to have to spare if an engine is struggling up a steep grade and it is doubtful whether or not it will stick fast.

We would recommend the educational advantages of a judicious course of firing to our correspondent. Some things can be learned in that way more satisfactorily than in any other. — EDITOR RAILROAD GAZETTE.]

Accidents Prevented by Bridge-Guards.

NEW YORK, PENNSYLVANIA & OHIO RAILROAD CO.,
ENGINEERING DEPARTMENT,
CLEVELAND, O., April 23, 1880.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As illustrating the efficacy of bridge-guards in protecting bridges and trains from accidents, I feel it almost a duty to forward you the inclosed letter for publication. Some two years ago I received instructions from the Receiver of the late Atlantic & Great Western Railroad (now New York, Pennsylvania & Ohio Railroad) to place a safety guard of my invention upon all our bridges. From considerations of economy, however, it has up to the present time been placed only upon a few which seemed most in danger; yet this is the fourth instance in which it is considered by the road-masters to have saved a train, two previous instances of a similar nature having occurred at a bridge near Bucktooth Station, and one near Mansfield. In the case at Bucktooth, one car became detached on a curve some distance back of the safety-guard, broke a rail on the curve, and was safely rerailed just before reaching the bridge. Before the damage had been detected a following train ran off at the broken rail, and the locomotive and head of the train got so badly shaken up and twisted before reaching the guard that they were not fully rerailed, but sufficiently so to save the bridge. The rear portion of the train left the track at the broken rail before reaching the guard, and was badly wrecked.

The following is the letter referred to, with respect to the most recent incident of the kind:

"MARION, O., April 22, 1880.

"Chas. Latimer, Esq., Chief Engineer,

"DEAR SIR: Some night train going east, on the night of the 20th, had a brake-beam down and one truck jumped the track at the east switch at North Lewisburg and ran to the bridge guard, about 500 feet, and jumped on again, unknown to the train-men. The bolts were broken on 22 joints and the outside spike on one side badly knocked about, but no other damage was done. I have no doubt but that this bridge-guard saved the bridge and train from a very bad wreck. Very respectfully, J. W. ALSOP,

"Roadmaster."

Readers of the "Roadmaster's Assistant" will find two other instances recorded, in which passenger trains were saved from disaster on the Chicago & Michigan Lake Shore Railroad in 1874, and also a cut of the guard. How many instances there may have been since, I cannot tell.

I do not, as I trust is needless to say, bring up these instances because the safety guard is my invention, but because it is so common—and I might almost say universal, taking the country at large—to omit all such precautions altogether.

CHARLES LATIMER,

Chief Engineer, New York, Pennsylvania & Ohio Railroad.

Experience with Crown-Bars and the Darby Arch on the Kansas Pacific.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Mr. John Mackenzie, Superintendent of Machinery at the Kansas Pacific Railway shops, Armstrong, Kan., is building a ten-wheeled locomotive having a boiler peculiarly adapted to the bad water they are compelled to use on this road, which yields a large amount of deposit in the form of scale.

The boiler is telescopic in five rings, and has a diameter of 50 in. in front and 53 in. at the back end. It has 165 flues, 2 in. in diameter, and 13 ft. long, placed $\frac{1}{2}$ in. apart at the front and $\frac{3}{4}$ in. at the back end. The fire-box is 65 by 33 $\frac{1}{2}$ in. and 68 in. high.

The legs front and back have 4 in. spaces. The legs at the sides are 2 $\frac{1}{2}$ in. at the bottom and 5 $\frac{1}{2}$ in. at the top of the fire-box. It has a box flange ring at the bottom and Darby's crown arch instead of crown bars.

This arch is said to give excellent satisfaction, and is being applied to all new locomotives on this road, and all old ones when new fire-boxes or crown sheets are needed. It was

put in 17 old boilers the last year, and the road has over 50 of them in use. Crown-bars have to be renewed in about seven months, while the first Darby arch, which has been in constant use 27 months, has no accumulation of scale, and the sheet seems to be as good and strong as at first. The lateral current of water from the top of the sheet seems to create a draft up the sides of the fire-box that prevents the deposit of scale upon or around the top of the fire-box, and the deposit is mostly at the bottom of the legs, where it is easily washed out.

Experiments have shown a saving of 22 per cent. in fuel by using this arch instead of crown-bars. And further, two engines of the same class have been overhauled, one given new flues and the Darby arch, the other new flues and crown-bars. From the first the Darby arch was the best steamer and would haul a greater number of cars—the difference increasing as the time went on, until in seven months the crown-bars must be renewed, and as yet none of the arches have been renewed. Besides the one already mentioned, four others have been in use nearly two years.

W.

The Reading's New Passenger Engine.

PATERSON, N. J., April 16, 1880.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In to-day's issue of the *Railroad Gazette* you give a description of the engine for the Reading Railroad built by Baldwin. I suppose, from the width of the fire-box, they intend to burn culm or coal-dust. Probably that has something to do with making but one pair of drivers and a pair of trailing wheels. This latter plan is not new. The Rogers Works, from 1846 to 1852, made several engines on the plan described, the trailing wheel being placed under the foot-board with a cross spring, the ends of which rested on the trailing axle boxes; a cross bar under the foot bar—connecting the frame on each side with a screw in the centre—was employed to increase or diminish the weight on the trailing wheels, and so changed the weight on the drivers. Of course the changing of weight could not readily be done by means of a screw, yet you will see that we had the general plan now embodied in the engine described.

The last engine made on this plan by Rogers was put on the Hudson River Railroad when it was first opened. It would run very fast, but the great difficulty with it was to get away from the stations—it would slip.

The Engineer of the road, John B. Jervis, and Mr. Rogers, having contemplated that for the Hudson River Railroad they would use for fast passenger engines one pair of drivers, and for freight engines two pairs of drivers, the company ordered from Rogers, Ketchum & Grosvenor the engines "Atlantic" and "Pacific," the former having four and the latter two drivers. These engines were to be patterns from which they were to copy to stock the road, but after their trials of the "Pacific"—one pair of drivers—they decided to make all with two pairs of drivers.

I am surprised that the Rogers Works, in their book—"Locomotives and Locomotive Building in America"—do not refer to those engines with one pair of drivers.

I think it well that the rising generation of locomotive-builders should be posted on what was done thirty years ago. They will find many old things now brought out as quite new.

J. C.

The Argument for State Railroad Ownership.

[Translated for the Railroad Gazette.]

Our readers know that for several years the question of changing the railroad policy of Germany from the "mixed system"—that is, a system composed partly of railroads worked by the state and partly of roads owned and worked by private corporations—to an exclusively state system has been warmly discussed, and finally decided in favor of the state system, which is begun by acquiring all the principal railroads of Prussia (not of the other German states) by the government of that country. When the Prussian cabinet submitted to Parliament last November its plan for acquiring the remaining important private railroads in Prussia, it presented with the bill granting the necessary powers and means a long and elaborate document in justification of its action, which is probably the most important government document respecting railroads ever published, and the most complete statement of the arguments in favor of a state railroad system.

It must be remembered that this question has had the attention of the best minds in Germany for several years, during which the books and pamphlets published concerning it probably number hundreds, and that thus the government had the opportunity to make use of all that could be said on this side of the question. Being thus the formal statement of the reasons which have caused for the first time one of the great nations of the world to unite its railroads under government administration, we have thought it desirable that it should be put on record in our language, for the benefit of railroad men, legislators and students of the economics and politics of transportation. Below we begin the publication of the portion of this document which is of general application and interest:

ARGUMENT FOR THE BILL CONCERNING THE ACQUISITION BY THE STATE OF SEVERAL PRIVATE RAILROADS.

THE PAST RAILROAD POLICY OF PRUSSIA.

The present condition of railroad affairs in Prussia renders the completion of the State railroad system absolutely necessary. The idea of consolidating the whole of the railroads of the country into one enormous net of iron roads, connected together for the facilitation of travel and forming a single transportation establishment under government control, was, under the former condition of the Prussian code of railroad laws, incapable of expression. Although the nature of railroads as public highways was never ignored, and is indeed plainly affirmed in the law of Nov. 3, 1838, yet their real importance as great highways for the movement of

armies and for universal intercourse did not become fully apparent until they had reached a later period of development. The inconveniences caused by the private management of railroads in consequence of the existence of a number of different enterprises of doubtful solidity and restricted working capacity; the abuse of their privileged position by their managers; the oft recurring resistance to reforms of public utility; the complication and for the most part arbitrary differences among the various administrative and working arrangements; the intricacy of the tariffs; the quarreling and extravagant expenditure accompanying the bitter competition existing among such a number of corporations have altogether caused the widespread injury to the public welfare that is inseparable from an extended private management of railroads. Meanwhile, on the other side, by the extended development of the government railroad management, another and a more favorable solution of the question was in preparation. The considerable increase in the government railroads that occurred on the annexation of the provinces acquired in 1866, and the establishment of connecting lines between the Eastern and Western railroads have proved the government railroad system to be unequivocally the best for Prussia, and it has gained thereby considerable ground against the so-called mixed system. The necessity has therefore become apparent for providing fully for the public interests, not by regulating the operation of the private roads through legislative reform and state supervision, which do not promise to be effective, but by the abolition of the private railroad system and the union of all the principal inland railroads in the hands of the government. The conditions which, under the old railroad laws, would have rendered such a solution of the question impossible, have fallen into the back-ground. The greater extension and compactness of the territory of the country, the development of its financial strength, and the fortunate state of the national credit have proved favorable to those ideas which deal with a question of such weight and importance to the state.

As long ago as 1873, in the report of the special commission appointed to investigate railroad charters, we find these ideas expressed in the following words:

"In consequence of the extension and perfection of railroads that have already occurred, and that may be expected to a greater extent in the future, economical reasons and considerations point to the desirability of the ultimate consolidation of all railroads in the hands of the government."

Since that time this result has been greatly favored by the further improvements effected in the condition of railroad affairs. The extent of the government railroads has been nearly doubled—the extent of the roads worked by the government already exceeds the total length of the roads under private management; the inadequacy of government supervision, which can hardly be remedied, in regard to the growing inconveniences characterizing railroads under corporate direction, has added largely to the numbers of those in favor of a state railroad system, while the attempts to bring about reform by laws have shown the futility of hoping for a satisfactory improvement through legal measures, without trenching materially on established rights and interests. The government, therefore, did not hesitate during the debates over the budget at the last session of Parliament to intimate to the members of the investigating committee that the ultimate aim of the railroad policy was the realization of the state railroad system, with a prospective view to the introduction of an act empowering government to acquire such private railroads as might be desirable.

It may be safely said that, to an impartial judgment, it is certain that the question whether the state railroad system is desirable for Prussia is no longer an open one; it is already decided in the affirmative. And although the unsettled state which the existence of powerful independent corporations in competition with the normally growing governmental railroad system will cause must be tolerated for a longer or shorter time, in consideration of the financial convenience of the government, it is impossible, as well as incompatible with the interests of the country, to maintain them permanently, and they would in addition be a source of economical injury of serious import.

Although after the above justification of this system it may hardly be thought necessary, we will endeavor in the following explanation to pass in review the chief points which have influenced the government to adopt and carry out the state railroad system.

I.

THE STATE RAILROAD SYSTEM AND ITS DEVELOPMENT IN GERMANY AND PRUSSIA.

The development of the railroad in modern civilized countries has been dissimilar and disproportionate, according to the conditions and peculiarities of the various nations.

The wealth of the country and the density of its traffic have determined the extent of the outward development; while its natural conditions, its relations, the peculiar characteristics of its people and the nature of its institutions have determined the method of that development.

In England and the eastern portion of the United States, the extensive commerce and great wealth prevalent have developed the railroad system to an extent that Germany in its present condition cannot attain, nor do her necessities demand it. The magnitude of the arrangements for the dispatch of traffic, the frequency and high speed of the trains and many other of the operating arrangements of the railroads in those parts, are only warranted where the wealth of the country furnishes the means for such an outlay, and the augmented expense is covered by a corresponding increase of business.

The extent of this development is by no means to be ascribed to the effects of the system under which it has occurred. The latter is the result of the domestic and foreign conditions and relations of these countries, of the national character and state institutions, and, in fact, of the internal economy of the countries. The geographical positions of both England and North America render the national defence of secondary importance in considering the system of railroads, when compared with the requirements of commerce—the commercial and industrial element in the population of both countries is vastly the most influential. In both countries, the government's care for the public welfare is narrowly limited. The furtherance of personal interests is left to the individual, the advancement of common interests to the narrow circle of those immediately concerned. In both these instances, the great independence and capacity for action of the individual gives the widest scope to private initiative, and renders the intervention of the government superfluous. It may thus be understood how private railroad management, in spite of the efforts made of late years to combat the theory, is thus credited with being most favorable to the perfection of railroad development.

It is otherwise in Germany, where different conditions have altogether changed the direction of development. The national defense, which, owing to the geographical situation, is of grave importance, the influential, if not paramount, military and official element in the population, the fostering care of the government for the public welfare in every department, the lesser effective capacity of the individual—all these circumstances point to the government as the most suitable conductor of enterprises, particularly as the political constitution of Germany presents grave difficulties to private

railroad undertakings. As early as Nov. 3, 1838, this view occurred to the revisors of the law regulating railroad enterprises, and they were only influenced by political considerations then existing, and ignorance of the importance and financial range of railroads, in giving scope to private railroad ventures provisionally. Formed by circumstances, state railroad management has manifested a more vigorous development as compared with private railroad management. Until the year 1850 the railroads in Prussia were under private control exclusively, with or without financial assistance from the government; from that period, with the removal of the beforementioned political difficulties, the government makes its appearance as a railroad proprietor, partly by building or purchasing on its own account considerable lines of railroad (often because no capitalists could be found willing to take up the enterprise), and partly by assuming the management and control of private railroads for account of the owners. Thus we find by the side of the private railroad management a state railroad property of growing proportions, though not formed into any system. Out of this confused state of affairs arose gradually the so-called "mixed system," which owed its origin to the efforts made to transform this disjointed, unsystematic condition of the state railroads into a well arranged and serviceable transportation system of leading lines, securing to the state a controlling influence in the conduct of transportation. The necessitous condition of certain private roads, in themselves eminently unfitted for private management, as well as the liberal means placed at the disposal of the government in 1870-71, in the shape of the war indemnity, favored the tendency toward a well-planned extension and constitution of the state railroad system. In this manner, out of the so-called "mixed system" arose naturally a majority of roads under state management, bearing in itself the reasons for its progress, and which will eventually result in the final transfer of the great controlling lines of private railroad into government hands. According to the method of development which is demonstrated in the foregoing explanation, the pure state railroad system for all leading Prussian roads will be the ultimate phase into which the present unsettled condition of railroads will find its solution.

DEVELOPMENT OF THE RAILROAD IN MODERN CIVILIZED COUNTRIES—TENDENCY TO CONCENTRATION.

In order to recognize the final aim of the national railroad development as an absolute necessity demanded by circumstances, the evolution of the railroad system in the principal civilized countries necessarily comes under observation.

At the first origin of railroads, the extent of the individual lines was confined to a length of barely 90 to 140 miles. The number of these independent corporations was rapidly increased, however, as soon as they were found to be paying undertakings, the rate of increase being about proportionate to the increase in mileage. The necessity for the establishment of direct communication between the chief traffic centres, by agreeing upon through trains and tariffs, and the consequent negotiation necessary between the different corporations respecting interests and arrangements common to all, soon made manifest the difficulties connected with a large number of separate managements. To this came the experience that with the extension of the administration the general expenses were proportionately reduced, and the constantly demonstrated superiority of the lines under one management over those made up of a number of short roads, with their attendant disjointed direction, with which the former came into competition. In addition, therefore, to the extension and greater proximity of lines in the already existing network of railroads, in addition to the constant starting of fresh enterprises, we find an early tendency to a fusion of the separate corporations into great systems. The nearer the construction of the network of the trunk lines approached completion, the more marked this tendency became. The avoidance of unnecessary outlay and unnecessary friction, and the necessity for a quicker and more simple agreement respecting matters common to the different lines interested, the formation of through routes for the principal currents of traffic, and last but not least the superior influence naturally exerted by the more powerful corporations over the smaller companies situated in their vicinity, all these circumstances have assisted in bringing about the consolidation of ownership, conduct or interests, which has resulted in a diminution of the number of independent administrations. In the countries where the private railroads prevail, we find a few great corporations that have gradually absorbed the other smaller ones. In those countries where a strong state railroad administration has been developed side by side with the private roads, the government has naturally had an important share of the smaller roads thus absorbed. In all countries which possess a fully-developed system of railroads, we shall be able to observe the gradual completion of a few great railroad systems, beside which, with the exception of secondary branches for the accommodation of local traffic, no new enterprise of any importance can be undertaken. Only in France, in consequence of peculiar events that have lately transpired, state railroad administration has attained a position by the side of the private lines that promises the possibility of a vigorous development in the future. On the other hand, in Belgium, Bavaria, Baden, Wurtemberg, Saxony, and latterly in Prussia also, it is the government through which the concentration of railroads, as demanded by the age, is consummated. In Austria, Italy and Russia, also, we find that this process has already commenced, although the more backward state of the railroad system in those countries has not yet made the necessity so pressing.

We may see therefore that from the period when the development of the railroads and the augmentation of traffic have reached a certain limit, the phenomenon of the fusion of the roads into one or a few great transportation systems makes its appearance. This appearance points unmistakably to a necessity, founded in the nature of railroad operation and the requirements of railroad traffic, of a single administration within a certain district. Whether this consolidation be left in the hands of private companies, or whether it be undertaken by the government, we must acknowledge that we have on one side the advantages that accompany unity of operation and administration, on the other the disadvantages that experience shows division and diversity in the railroads bring with them, both operating in furtherance of the realization of the constantly growing tendency to consolidate the lesser with the more important enterprises, and bringing us nearer the final object; the formation of one grand system of intercommunication under a single direction.

GOVERNMENT PROTECTION OF SUCH PUBLIC INTERESTS AS ARE AFFECTED BY THE RAILROADS.

The railroad laws of all countries are founded on the experience, that the most important public interests are affected by railroads, and the responsibility of the protection and advancement of these interests rests with the government. For this reason we find imposed on the roads, with their legal privileges, a number of obligations respecting their construction, operation and administration, by which the otherwise free inclinations of the proprietors are limited in the public interest. In all legislation the railroads are, therefore, placed under the supervision of the state, the officers of which are granted well defined and regulated

authority for the protection and preservation of public interests. None of these legislative measures has been limited to this indirect supervision by the state however; in every case, in addition to providing for the careful regulation of the railroads in their relation to public interests, the idea is foreshadowed that this regulation may not suffice for the purpose intended, that at the same time some other way must be kept open by which the government may provide effective protection to the public interests; that their future development may demand instead of the indirect supervision the direct administration of the railroads by the government. In all laws relating to this subject, from the earliest initiation of railroad enterprises, the idea has been incorporated and is expressed in many different ways, that the possible acquisition of all roads must be reserved as a government right, whether it be arranged by act of legislature, or in return for several privileges granted, that on the expiration of the concession,* after the lapse of a certain time, the line is to become government property; or whether it may have been stipulated that after a certain stage of development of the separate private railroads has been attained, the government shall have the right to acquire them on payment of a previously determined sum of money. To be sure, these arrangements have, so far as is known, not yet been practically carried out, either because the stipulated period of time has not yet elapsed on the expiration of which the government rights come into effect, or because the legal or agreed conditions respecting the means of acquisition have not proved advantageous to the interests of the government.

In spite of this, the experience of the inadequacy of state supervision for the protection of public interests concerned has caused the question of the advisability of transferring the railroads to the government to be by degrees raised universally. In the proceedings of the legislative bodies and in the reports of investigations instituted by governments, in discussions in the public press, and in countless pamphlets and treatises, this same question has been the subject of exhaustive discussion. Already we find in the railroad policy of many of the European countries a tendency by appropriate acquisition of private roads to placing railroads in the hands or under the predominant influence of the government. Recent events in Bavaria, Saxony, Belgium, France, Italy and Austria† have shown in the national policy the extent and importance of this tendency to turn the railroads over to the state. In Prussia this policy has been encouraged by the great extension of the state railroads of late years and the approval of last year's Parliament, and it only remains to be determined what time shall be fixed for the completion of the system.

It is evident from the foregoing that, in legislation, in the current of popular opinion, and in the policy of the different states, the opinion is being urged more forcibly than ever, that railroads are of such extended and constantly increasing importance to public welfare that they cannot be permanently abandoned to private management, but should be placed in the hands of the government.

In the development of the railroad system, as we have endeavored to explain above, the following appear unmistakably as the ends which it is expected to attain:

1. Complete unity of administration and operation within a certain commercial district with government boundaries.
2. Direct attention by the government to public interests, which do not permanently find sufficient furtherance and protection where the railroads are in the hands of private corporations whose object is gain. Just as clearly as we find these aims expressed in the foregoing explanation of the development of a railroad system, are they manifested, on close observation, in its peculiar nature.

The exigencies of railroad management and the commerce these roads are expected to foster demand the consolidation of the owning, administering and operating powers into one paramount authority. Meanwhile, with the growing importance of the public interests depending upon railroads, the inadequacy of private management and state supervision becomes daily more obvious, so that the problem of taking the chief management of inland railroads into its own hands is imperatively forced on the government.

(TO BE CONTINUED.)

Erie Canal Tonnage.

As usual, the opening of navigation on the canals of this state has occasioned many exaggerated statements with reference to the canals, the number of boats employed on them, and their tonnage. The following, taken from an article in yesterday's New York Herald, announcing the resumption of business on the water route, is a fair sample:

"At the Atlantic and Erie basins, and on the Jersey side, boats have been undergoing repairs and put in readiness, giving those localities a busy and lively appearance. During the past winter over six thousand canal-boats laid up in this city. Most of these have already gone up the river, ninety having started for Troy on Saturday night. The remainder are loading and being towed from their winter quarters as fast as possible, and will soon be trailing up the river for the first trip. It is estimated that between now and the 10th of next month there will be 10,000 boats on the Erie heading for Buffalo. Returns show that there are over five million bushels of grain in that city awaiting transportation to tide-water. This large amount is being constantly increased by shipments from the West, and promises to keep the boats busy during the entire summer."

If the above means anything, it means that there will be 10,000 boats headed toward Buffalo on the Erie Canal in a few days in search of grain cargoes at this port. How very wide of the mark this is will be seen by the presentation of a few facts. Canal-boats are subjected to inspection and rating by insurance companies just as any other class of vessels is. Consequently, no boat that will not rate up to third-class is insurable for grain-carrying purposes. The Canal Insurance Register, which is prepared for the benefit and guidance of underwriters, and is therefore good authority, gives the following as the total number of boats in each classification on Jan. 1, 1870, 1876 and 1880:

	Class.			Total No. Boats.	Total Tonnage.
	1st.	2d.	3d.		
1870.....	959	901	643	2,503	570,684
1876.....	732	486	563	1,781	465,840
1880.....	646	796	570	2,031	469,181

It is apparent from the above, therefore, that at no time in the past ten years the number of grain boats navigating the canals of New York state has exceeded 2,503, while at the beginning of this year there were only 2,031 insurable for this service. But it must be borne in mind that of the number now commissioned as grain-carriers, there are from 200 to 300 employed about New York Harbor as lighters, trading on the Sound, up the North River, and through the Southern canals to Philadelphia and Baltimore. From 400 to 500 belong on the Northern canals, and about 200 more are employed in the interior trade and never come to Buffalo; so that the entire grain business from

Buffalo to the East is transacted by from 1,000 to 1,200 boats. This statement will doubtless create considerable surprise among those not familiar with the subject and will probably be received with some grains of allowance in commercial circles. Nevertheless, we maintain that in no year since 1870 have as many as 1,300 boats been engaged in carrying grain from this port to the eastward. The following statement showing the amount of grain exported from Buffalo by canal in each year since 1870, the number of boats carrying 7,600 and 7,700 bushels, and making six trips a season, that would be required to transport the amount of grain shipped, and the average season rate on wheat, is sufficient evidence on this point:

Years.	Grain, bushels.	No. of boats.	Freight, cents.
1870.....	29,430,881	645	11.2
1871.....	48,184,997	1,057	12.6
1872.....	48,474,380	1,063	13.1
1873.....	50,523,312	1,108	11.5
1874.....	40,986,834	899	10.1
1875.....	35,353,611	775	8.0
1876.....	27,652,776	606	6.6
1877.....	44,101,689	955	7.4
1878.....	58,567,734	1,268	6.0
1879.....	53,892,142	1,107	6.8

For the entire period covered by the above the average number of boats employed in the Buffalo grain trade was less than 1,000. But, as the Herald suggests, the prospect this season is excellent, 20,122,000 bushels of grain being in store at the Western lake ports now and 3,778,000 bushels here, and it is probable that a larger number of boats will start West at the opening than usual. Instead, however, of the fleet numbering 10,000, as stated by our metropolitan contemporary, it cannot possibly exceed ten or twelve hundred.—Buffalo Commercial Advertiser

Steam on the Canal.

In his forthcoming report State Engineer Seymour will devote considerable attention to steam propulsion on the canal, and will give the results of his observations on his trip from Buffalo to New York last Summer, on the steamer Emma. Mr. Seymour believes that steam is a success with the canal in its present condition, but that it could be made a still greater success, and that transportation could be reduced about a half, by making certain comparatively inexpensive improvements. These have been frequently referred to by Mr. Seymour before, but in his report for 1879 he will take occasion to emphasize their importance, and to show how much the value of the Erie Canal can be enhanced by the general introduction of steam.

In giving his reasons for making the tour of observation, Mr. Seymour says:

"Believing that a careful test of the economy of moving grain by the Illinois system would be of use in solving the problem of canal transportation, and being anxious to learn by experience just what the obstacles are in the way of all boats navigating the canals, I made arrangements with Captain Hathaway, of the steamer Emma, and her consort, to carry from Buffalo to New York the engineers in my department and myself, with the apparatus necessary to determine the power developed by the engine, the velocity of the currents, and so forth. * * * The Emma and her consort, the Hathaway, were loaded with wheat at Buffalo on the morning of July 11, the former having 7,300 bushels, or 217 tons, and the Hathaway 7,800 bushels or 234 tons. They were examined by the official inspector at Buffalo and Black Rock, and the draught found to be exactly six feet."

No special facilities were given the Emma and her consort on this trip. Mr. Seymour desired to see the results of a practical application of steam to an Erie canal-boat, with the Illinois coupler-attachment, under ordinary circumstances, and the record of the voyage shows that it was an ordinary run and nothing more. Low water and seed-grass were encountered, and vexatious delays at locks were experienced. The detentions for lockages aggregated 26 hours and 51 minutes; for low water, 8 hours and 21 minutes; for supplies, 2 hours and 42 minutes; and on account of experiments, 2 hours and 40 minutes; and in the river for supplies, 1 hour and 3 minutes, and on account of experiments, 1 hour and 20 minutes, making the total running time 8 days and 12 hours, or, including lockages, 9 days 14½ hours. This is nearly one-third less than the average running time of horse-boats. The consumption of coal on the trip aggregated 87.10 tons. In brief, Mr. Seymour estimates that two boats operated with the Illinois coupler and propelled by steam, could make nine trips a season for \$500 less expense than boats towed by horses can make seven."

If the Engineer is correct in his calculations, it is clearly for the interest of every boatman to make the change from horse-power to steam-power as soon as practicable; for, with the latter, the cost of operating is reduced, while the revenues are materially increased. The great impediment in the way of this change, however, is its first cost. This is quite an item, and would probably average about \$2,800; but if the cost of the mules or horses necessary to navigate two boats, with their harness and other equipments, is deducted from this bill, as it should be to make a fair exhibit, the cost of converting two first-class lakers into a steamer and consort would not exceed \$1,500. The difference in the net earnings of the boats under the two systems, as matters now stand, will nearly wipe out this item in one season. But with the introduction of steam the up-movement of merchandise by canal would largely increase and the earnings of steamers would be materially augmented thereby.

But probably the most interesting part of Mr. Seymour's report is that which shows the speed of the steamer Emma, and the consumption of fuel depended on the depth of water in the channel. The canal from Buffalo to Lockport is 9 ft. deep, and from Lockport to Rochester the average is nearly 8 ft. The average time of the Emma and her consort between these points, after deducting the effect of the current, was 2.3 miles an hour, with an expenditure of fuel of 25.7 pounds to the mile; while from Clark's Bridge to the Richmond Aqueduct, where the water was less than seven feet deep, the speed was only 1.7 of a mile an hour, and the coal burned was 52.8 pounds per mile, or 30 per cent less speed, with more than twice as much fuel. If the canal throughout its entire length was as deep as that part between this city and Rochester, the speed could be increased enough to save a full day on each trip with the same consumption of coal. By using the waste water as a power to draw boats into the locks and out again, Mr. Seymour thinks that thirteen hours more could be saved on each trip. In other words, he believes that by deepening the canal a foot and introducing power at the locks a day and a half could be saved each trip, which would enable steamers to make two more trips a season than at present, and horse-boats one. Now all these improvements could be made for a comparatively small outlay of money. It is certainly to be hoped that the Superintendent of Public Works will make his improvements and repairs with the design of ultimately giving to commerce an eight-foot canal with power-locks.—Buffalo Commercial Advertiser.

* In most European countries one of the provisions of railroad charters is that after the expiration of the period of concession (which in France is 100 years) the road shall become the property of the government.—TRANSLATOR.

† They will be found elsewhere treated as a separate subject.



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EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

RAILROAD EARNINGS IN MARCH.

Our table has reports of earnings for March for no less than 53 railroads, which worked in the aggregate this year 29,939 miles of road, which is about 35 per cent. of the total mileage in operation in the United States. Of the whole number there are only two (the Central Pacific and the International & Great Northern) whose total earnings were not larger than in March of last year, and only three which have smaller earnings per mile of road, although the aggregate mileage of the 53 roads has increased 9 per cent. in the year. The increase in aggregate earnings has been more than \$5,000,000, or 30 per cent., and the average earnings per mile of road have increased from \$610 to \$713, or about 19 per cent.—the largest increase yet reported. Many of the roads show a vast improvement—four an increase of more than 100 per cent. in total earnings, while those which have an increase of 50 per cent. or more in earnings per mile of road number no less than eight, including the Cairo & St. Louis (increase 53 per cent.), the Canada Southern (81), Chesapeake & Ohio (68½), Denver, South Park & Pacific (173), North Wisconsin (97), Peoria, Decatur & Evansville (106), the main line of the St. Louis, Alton & Terre Haute (55), and the Wisconsin Valley (90 per cent.). Most of these roads have still light earnings per mile, and all but two are much below the average, so that the improvement in many cases is attributable partly to having very poor earnings last year. One, however, the little Denver, South Park & Pacific, has what would be called large earnings per mile almost anywhere, exceeded this month by only three of the railroads that report—the New York Central, the Pennsylvania, and the Philadelphia & Reading. The cause is that there is a great rush of passengers and freight to Leadville and the mining districts beyond, and that this road gets the bulk of this traffic at very remunerative rates.

There are six roads reporting which have a large share of through trunk-line traffic. Last year this traffic was carried at rates based on a Chicago-New

York rate of 20 down to 15 cents; this year the rate was 35 cents for grain throughout the month, and the traffic was large without example. It was to be expected, therefore, that there should be a great increase in the income from this traffic. It is seen best in the increase of 80.7 per cent. of the earnings of the Canada Southern, which has little except through traffic, and one of 35 per cent. in the Cleveland, Columbus, Cincinnati & Indianapolis, about 80 per cent. of whose freight is through. But the trunk lines themselves have not profited so much as might have been expected from the increase, the New York Central earning 15.4 and the Pennsylvania 25.9 per cent. more than last year, while the business of the latter must have been greatly increased by the activity in the iron business, and of both by the greater general activity, which stimulates the local traffic. The roads which seem to have profited most by the better through rates are those west of the trunk lines, and especially those crossing Illinois south of Chicago, whose traffic is largely from pro-rating points, such as Peoria, Hannibal and St. Louis, and whose whole traffic is very greatly affected by the through rates. Thus the Toledo, Peoria & Warsaw has gained 40.7 per cent. in earnings per mile, the Indiana, Bloomington & Western 44.2, the Wabash (which, however, has so changed since last year, and has so much of its lines west of the Mississippi that the comparison has little value) 17.2 per cent., the St. Louis, Alton & Terre Haute main line 55.3 per cent. This indicates that the maintenance of through rates is of much greater relative importance to roads of this class than to the trunk lines or any other railroads. Their harvest, however, is likely to be confined to the winter and fall—or, to speak more exactly, to the times when lake navigation is closed or lake rates high. Last March, with lake navigation closed and rail rates much higher than usual of late years, the rail grain movement, as we have shown heretofore, was the largest ever known in a single month. The average weekly shipments from seven Northwestern markets during that month were 3,740,000 bushels, besides large quantities from smaller interior stations. This month, since navigation is opened, the rates have been reduced one-seventh and the rail through shipments more than one half, to 1,500,000 bushels a week or less. It is probable that the class of east-and-west roads just mentioned will suffer most from this, and that those which carry from the same territory to the lakes, and especially to Lake Michigan, will gain by it.

Six railroads in the list are chiefly engaged in carrying produce to Chicago (or Milwaukee). These have in the aggregate 6,929 miles of road, which is nearly 15 per cent. more than they had last year; their aggregate earnings are 35½ per cent. larger than last year, their earnings per mile of road having increased from \$444 to \$521, or 15 per cent., which is below the average rate. This is accounted for because the proportion of new road here is much greater than the average—15 per cent. against 9—and this new road is mostly in new country.

Four roads are chiefly engaged in carrying to St. Louis; these have 1,430 miles of road only, and 16 per cent. more than last year. Their aggregate earnings have increased 42.8 per cent., and their average earnings per mile from \$417 to \$512, or 23 per cent. There is but a small proportion of the roads carrying to St. Louis that can be included, even of those that report. The large system of the St. Louis, Kansas City & Northern is now included with that of the Wabash, whose chief business is not carrying to St. Louis, though it does carry there a great deal of farm produce from points east of the Mississippi even; and the Chicago & Alton must continue to be considered chiefly as a carrier to Chicago, though it is now an important carrier to St. Louis from the West, as it always has been a considerable one from the East. Moreover, like the other roads from St. Louis to the east, the main line of the St. Louis, Alton & Terre Haute carries a good deal of grain, etc., to St. Louis, which is not the case with the roads from Chicago eastward. The trans-Missouri roads are represented by three lines, which however include a very large proportion of the whole. Of these the Union Pacific (now including the Kansas Pacific and branches) shows an increase in earnings per mile of 31 per cent., and the Atchison, Topeka & Santa Fe one of 2 per cent. Considering the long extension of this latter road through a very thinly peopled country, it is surprising that it has been able to keep up, not to say increase, its earnings per mile. They are fully up to the average of American railroads (which for the last year reported was \$6,210, or at the rate of \$517 per month).

The very great improvement of the lumber roads, which we have heretofore noted, continues. Five lumber roads report, with 926 miles of road—5.2 per cent.

more than last year. Their aggregate earnings are 49½ per cent. more than in March last year, and their average earnings per mile of road have increased from \$289 to \$418, or 44½ per cent. It should be noticed, however, that these roads had very light earnings last year (not one-half—47 per cent.—of the average of the roads reporting), and still have light earnings this year (about 58 per cent. of the average). They seem, however, to have improved more than any other class of roads except the east-and-west lines south of Chicago.

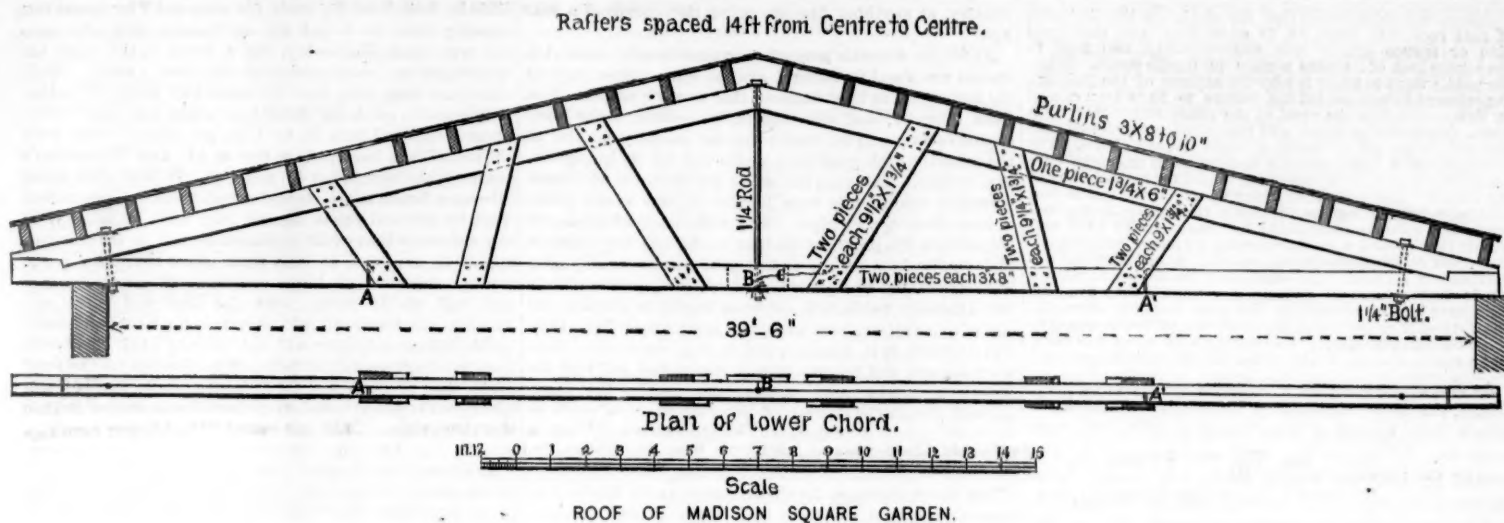
Herewith we give a table showing the earnings per mile of road in March for the past five years for several roads. For 17 roads these March earnings are given for the last five years, for 22 for the last four years, and for 25 for the last three years. Only two out of 25 roads had larger earnings per mile in 1879 than in 1878; and likewise only two out of 25 had them larger in 1878 than this year. Only one out of 22 had larger earnings in 1877, but four out of 17 had them larger in 1876. Twelve of the 17 roads that report for the five years had larger earnings this year than any of the four previous years.

March Railroad Earnings per Mile of Road.

	1876.	1877.	1878.	1879.	1880.
Atch., Top. & S. F.....	\$205	\$206	\$376	\$509	\$580
Bur., C. R. & North.....	229	199	295	258	383
Cairo & St. Louis.....	135	142	136	135	206
Central Pacific.....	879	750	594	587	535
Chicago & Alton.....	560	510	527	483	717
Chic. & East. Ill.....	359	334	469	357	382
Chic. Mil. & St. Paul.....	513	433	526	513	609
Chic. & N. W.....	187	194	178	231	
Cleve. Mt. V. & Del.....	469	553	549	726	741
Hannibal & St. Jo.....	590	514	492	469	544
Ill. Cent., in Ill.....	405	284	332	328	300
Ill. Cent., in Iowa.....	401	461	380	548	
Ind., Bloom. & West.....	217	194	237	224	
Int. & Gt. North.....	406	440	448	433	542
Louisville & Nash.....	125	161	109	156	
Mem., Pad. & North.....	297	315	301	286	419
Mo., Kan. & Tex.....	284	263	315	300	333
Mobile & Ohio.....	155	145	120	160	
Pad. & Eliz.....	1,457	1,457	1,517	1,815	
Pennsylvania.....	869	869	1,301	1,574	
Phila. & Reading.....	695	612	548	632	770
St. L., A. & T. H., Belle-	403	512	502	516	658
ville Line.....	185	185	246	280	
St. L., I. Mt. & So.....	307	309	459	385	542
Scioto Valley.....	523	575	538	631	
Tol., P. & Warsaw.....					
Wabash, St. L. & Pac.....					

It is probable that March will prove to be a more favorable month than those which follow it. For all through traffic from the West to the East north of the Ohio it was a month of extraordinary traffic and good rates, while in the corresponding month both in 1879 and 1878, though the traffic was large, the rates were extremely low. Now the difference between the rates last year and this will probably be less hereafter, because last year they had gone nearly as low as they could go (but not quite as low as they did go) as early as the end of March, and at the very low rates the railroads got more traffic than they will be likely to get this season while navigation is open. Indeed, the comparison between the gross earnings from through traffic hereafter will probably not be a good criterion of the actual improvement in business, because the large business of last year before August was done at a loss, and however small the business may be this year (and it promises to be very fair and not very much smaller than last year), it will be made to yield a profit. The lakes and canal, however, as usual, are likely to carry most of the grain, and the whole railroad through traffic will be much smaller than before April, so that even an increase of the same percentage in the earnings from it would be a much smaller sum. How much smaller the through east-bound traffic will be may be judged by the fact that while in March the average weekly rail shipments from Chicago were the enormous amount of 71,200 tons, for the last two weeks they have been 35,000 and 33,000 tons respectively, which is certainly a very handsome business, but of course cannot yield earnings like the March traffic.

For the three months ending with March, our table has reports from 52 roads. These had this year 30,861 miles of road and 8.9 per cent. more than last year. With this increase of mileage their earnings were increased 27.4 per cent.—equal to \$13,302,047. In average earnings per mile of road the increase was from \$1,711 to \$2,001, or 17 per cent., and this with a very large mileage of new railroad, most of which must have very light earnings this year. Of the 52 roads only one, the International & Great Northern, earned more last year than this, and only three had larger earnings per mile then. No less than nine roads show an increase of more than 50 per cent. in earnings per mile, and on 17 more the increase is more than 25 per cent. Among those that report, the Denver, South Park & Pacific appears for the first time. This little narrow-gauge road, in a country where three years ago there could hardly have been traffic enough to enable it to earn a hundred dollars a month per mile, reports \$3,234 per mile earned in the first three months of this year—twice as much as the Chicago & Northwestern and three times as much as the Chicago, Milwaukee & St. Paul earned per mile, and exceeded only on four of the 52 roads reporting—the



New York Central, the Pennsylvania, the Philadelphia & Reading and the Northern Central.

Among reports rarely published will be noted those of the Canada Southern, whose traffic is almost all through, which has earned 64 per cent. more than last year; of the Chesapeake & Ohio, which has been able to do a very considerable through business between the East and the West this year, the rates on the direct all-rail routes being maintained, so that with the discount from regular rates necessary to secure traffic it could still make profit enough on it to render it earnest in soliciting business; and of the Northern Central, which has become a great carrier of grain, etc., to Baltimore, forming the outlet to that city not only from the vast system of the Pennsylvania, but from the Vanderbilt roads also, and shows a larger percentage of increase in earnings than either the Pennsylvania or the New York Central. For the three months the two latter show nearly the same percentage of increase; but the Central had much the greatest gain in January, while the Pennsylvania has gained fastest in the other two months. The three Canada roads show very different rates of increase, while the Canada Southern's gain, as we have mentioned, was 64 per cent., that of the Great Western, which is its near neighbor, was but 11 per cent., and the Grand Trunk's was 24 per cent. It should be remembered that the Canada Southern is nearly all main line, and that the other two roads are great systems with a very much greater proportion of local traffic, on which the rates have probably been little if any increased. The seven roads which have most of the trunk-line traffic with very nearly the same mileage earned 19.8 per cent. more than last year, and their average earnings per mile increased from \$3,314 to \$4,070, or 23 per cent., while the average of all the roads reporting has been 17 per cent. Here, as in the earnings for March, the immediate Western connections of the trunk lines seem to have profited more from the maintenance of east-bound rates than the trunk lines themselves.

What was said above as to the future of earnings may be recalled here. With the opening of navigation the course of them always becomes uncertain for a great many roads east of the Mississippi. They depend to a considerable extent on the rates that may be made by the lake vessels and canal boats until after harvest, and the harvest determines to a great extent both rates and traffic after July. There is probably at this time as much traffic in Western produce to be moved as there was last year, and shipments westward are a great deal heavier. One element which will affect considerably the earnings of the trunk lines and of several other roads is the foreign immigration, which has begun on a great scale and bids fair to be the largest ever known. It is probable, too, that passenger traffic will be generally larger this year than in any other since 1876; though this expectation is based on the greater general prosperity and not on any reports of earnings. But the great element that will affect the earnings of the remainder of the year is the coming harvest, concerning which little can be foretold at this date. Should the yield be good, we will be sure of an immense traffic; but should there be a good crop in Europe also, then prices of grain would be quite sure to be very low, and all the carriers would have to accept low prices for carrying it. The past crop-year was a remarkable and doubtless an exceptional one. There was at once immense crops and high prices, conditions which are very favorable to good rates of transportation, and these have been secured so far for nearly the whole period since the new crop began to come forward freely. However complete the coöperation of the railroads, it

cannot be expected that these favorable circumstances will prevail hereafter. There will doubtless be seasons when the railroads will be compelled to carry grain at a slight expense over the bare cost of handling it, and next year may be one of them.

THE ROOF OF MADISON SQUARE GARDEN.

The causes of the failure of the roof of the Madison Square Garden, which fell on the evening of April 21, will be of special interest to many of our readers, from the fact that the construction of roofs of various kinds forms so important a part of railroad engineering.

The engraving herewith represents one of the roof trusses which fell, and a plan of the lower chord. The span, it will be seen, was, in round numbers, 40 ft., and the height of the truss in the centre, 6 feet. The main rafters were 8 x 6 and the lower chord or tie-beam was made in two parts, each 8 x 3 in. One of these parts consisted of two pieces butted together in the centre at B. The other was made in three pieces, butted together at A and A'. A splice piece was nailed over the joint at B in some of the rafters; but after they fell it was difficult to tell whether such pieces were nailed to all of them. The pieces forming the tie-beams were simply nailed together, and we believe it was to this insecure way of fastening that the fall of the roof was due. It will be seen that it had comparatively little rise in the centre. The purlins, too, were unusually heavy (the covering of the roof was of paper tarred), so that the thrust of the rafters, and the consequent strain on the tie-beam, was very great. It will be noticed that between the joints A and A' the whole tensile strain due to the horizontal thrust of the rafters had to be resisted by the nails which held the two pieces together between these two points. These nails were subjected to a shearing strain. All the rafters which fell were broken through the centre of the tie-beam, as indicated by the irregular line at C', the two halves of each rafter being intact. On examination it was found that the joints at A and A' were drawn apart about 5/8 in., showing that the nails yielded under the strain, and thus allowed the tie-beam to stretch. When this occurred there was of course nothing to sustain the rafters, and all their weight and that resting on them had to be supported by the tie-beam alone, which was then, of course, broken in two in the centre.

The wonder to any engineer who examines the roof will be that its builders were able to make it stand up at all, and that it did not fall down before the roof was covered. The braces, it will be seen, were simply nailed to the rafters and the tie-beams, and were arranged in the most ignorant and stupid fashion, and evidently the designer of the roof, if there was one, had no idea at all of the purpose which those braces are intended to fulfill.

There is no language expressive enough to describe the brutal, blundering stupidity of the whole construction. It would seem as though those who built it did not know enough about the strains to which a structure of this kind is subjected to tell whether that on the tie-beam was one of tension or compression. The roof was made so that the tie-beams, which were subjected to a tensile strain, were only suited to resist one of compression, whereas the rafters, which were compression members, would safely have withstood a very great strain of tension.

It is safe to say that if the two parts of each tie-beam had been bolted together with a dozen 5/8-inch bolts, which would have cost less than a dollar for each rafter, the accident would not have happened, but unfortunately those who built the roof, or had it built, were too ignorant or indifferent to the safety of life to go to the expense.

The daily papers have been discussing the question of the responsibility for this blunder with a good deal of indignation, and generally have vented their wrath on the inspectors of the Building Department for permitting such a structure to be erected. This indignation is not misplaced, but what shall be said of the owners of the building? How did it happen that work of this importance was intrusted to persons without any knowledge of the most elementary principles of construction? The building has been used for a number of years for public entertainments, and is frequently filled with immense crowds of people. A warning was given a year or more ago by the fall of a gallery during a walking-match, and several persons were then injured. The additional story which was added to the Madison avenue front, and which was covered by the roof which fell, was at any time liable to be filled with a dense crowd. Under these circumstances it would seem to be the plain duty of the owners to employ some person competent to design a structure of sufficient strength for the purposes for which it was intended. Now what kind of men were employed? The construction of the roof will be the answer. Further, when the owners of the building made the contract with the parties who did the mason and carpenter work, were any precautions taken or stipulations made to secure its safety, and if not, why not? Did the owners say to the contractors, "How much will you build a roof for?" and did their silence imply "no matter whether it is safe or not?" If it is shown that no adequate effort was made to secure its safety, a terrible responsibility will rest on those who neglected their obvious duty. But it will be said by those people, as they are already reported to have said, that "responsible men were employed to construct the improvements, and the plans were approved by the proper authorities." Just what is meant by responsible men is not clear. Their work proves that they were grossly ignorant or criminally careless, and if the approval of the authorities referred to of any plans which are submitted will relieve the owners of buildings of the duty of making sure that they are safe, the sooner those authorities are deposed the better for the public.

It will be claimed, no doubt, for those who built the roof, that they were practical men, which, no doubt, in one sense, they were; but the calamity points out with terrible vividness the danger of ignoring what is called theoretical or scientific knowledge. The contempt which those who have the control of this building manifest for all such knowledge is well known. In their administration of affairs it has no place, and no value whatever is assigned to it in conducting the great operations of which they have charge. It is no wonder then that such mournful blunders are sometimes perpetrated under the sway of their authority. In one of the daily papers, "a gentleman, high in authority," is reported to have said that "the company assert that it had no idea that the calamity could occur," which is probably true; but it also appears as though the company were not at any pains to have any ideas at all on the subject.

Since the first part of this article was written, the following letter has appeared in the New York Herald, in which the causes of the failure are set forth so clearly that it is reprinted entire:

"It can be seen by the roof trusses now standing at Madison Square Garden that the tie-beams are, to say the least, of a peculiar construction, their strength not depending on the quality or quantity of timber that is in them, but on the nails that splice them. In lieu of using a continuous beam, by a happy thought the author of this construction spikes or nails five over-lapping scantlings together, and provides for a tensile strain of some six tons with a splice that would not safely sustain one ton. Any practical

architect or builder knows that the strain on the tie-beams of that roof was from six to eight tons, and that good pine or spruce timber will sustain safely two tons to the square inch of its cross section in tensile strain. What the public want to know is why the experts of the Building Department have reported the failure to have been caused by flaw or defect in the wood of the beam rather than by a plain, simple case of stupid and ridiculous construction that any tyro in the art of building could see at a glance. The fractures which they endeavor to show to be the cause were transverse breaks, to be easily accounted for in the falling of the trusses. The gradual drawing apart of the splices had evidently been going on for some time prior to the final crash, and gave the indications by cracks in the walls and plaster that proved a timely warning for many that escaped. The strain on the tie-beams of the roof in question was approximately six tons. The strength of the timber to resist a tensile strain used in the tie beam was not less than five tons per square inch of section, or 100 tons breaking strength. The method of constructing the tie did not utilize the strength of the timber, but simply the strength of a lap and nails, that a strain of a ton would render unsafe and dangerous."

As this correspondent points out, and as was shown before, the most elementary knowledge would have shown how unsafe a truss constructed in this way must be. Whenever any work of this kind is conducted by ignorant people, there will always be a chance that some simple principle will be disregarded, and a great danger be thereby incurred. It may be said though, that even when the most eminent engineers are employed, blunders are sometimes perpetrated, and the Tay Bridge might be cited. This is, of course, true. The wisest men sometimes make mistakes, and the utmost human skill and knowledge are not infallible; but it is absolutely certain that a very large proportion of the risks are eliminated by placing the charge and responsibility of important engineering work in the hands of men who, besides mere practical workshop experience, have a more or less thorough knowledge of the theoretical principles which should determine the design of such structures. At any rate, such blunders as that at Madison square would be almost impossible in such hands.

In this connection it would be proper to call attention again to the fact that the fast and heavy express trains on the New York Central Railroad are now without efficient continuous brakes. It is safe to predict a more or less serious accident, which would be prevented if the trains on that line were equipped with some of the improved appliances now generally used on other lines. The last New Hamburg accident was a very distinct warning, and certainly will not be the last. Can this company afford to wait for some more serious disaster, before it will adopt the means of averting such danger that other lines have used for years past?

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Cleveland, Tuscarawas Valley & Wheeling.—Extended east by south to Bridgeport, O., 9 miles.

Franklin & Pittsylvania.—Completed from Pittsville, Pa., westward to Rocky Mount, 33 miles. Gauge, 3 feet.

Missouri Pacific.—The *Ottawa Branch of the Kansas & Arizona Division* is completed from Osawatomie, Kan., west by north to Ottawa, 21 miles.

Pennsylvania.—The *Southwest Pennsylvania Branch* is extended from Oliphant, Pa., southward to Fairchance, 2 miles.

Southern Pacific.—Extended from Tucson, Arizona, eastward to Tombstone, 35 miles.

This is a total of 100 miles of new railroad, making 1,096 miles thus far this year, against 391 miles reported at the same time in 1879, 267 miles in 1878, and 269 miles in 1877.

PRICES OF IRON have fallen so much within a few weeks as to make a considerable reduction in the cost of railroad construction and maintenance. But the sudden fall has not stimulated, but rather restricted, the demand for the present, for the simple reason that buyers fear that before they need to use the iron it will be cheaper still—just as they were eager to purchase, when prices were rising from week to week. There is a limit below which prices are not likely to fall, however, under the present circumstances, and that is the cost of importation; and it must not be supposed that this cost of importation is likely to become nearly as low at any time this year as it was a year ago, when importations began to be made on a large scale. For, though doubtless a large and probably the chief cause of the advance in foreign iron has been the American demand, we cannot expect that the diminution or cessation of that demand will be followed by a recurrence to last year's prices. The lowest price at which foreign steel rails have been imported, so far as we know, has been \$55; and at that time the current price for ordinary steel rails in England and Belgium was not more than \$22. But since that time the cost of production in these countries, as well as here, has increased materially: the iron-master has to pay a good deal more for coal, ore and wages; and although these will doubtless fall somewhat with lower prices for iron, they will fall slowly and only under the pressure of great necessity to the rates prevailing a year ago. Indeed, it must be remembered that the prices then were universally recognized as altogether out of proportion to the cost of production, possible only for the most fortunately situated works, and barely paying expenses at these, the others being generally closed. It is not likely that the foreign works will be willing or able to supply this

country at anything like the prices they accepted a year ago.

As for the domestic production, a considerable element in its cost was fixed for several months when prices were at the highest. The blast furnaces that receive supplies from Lake Superior, and some others, we believe, make their contracts for ore in the winter for the whole year, and at the same time this year have contracted for its transportation by lake. This year the prices for both ore and transportation were such as were justified by the winter prices of iron—that is, very high. Thus, with the greatest possible reduction in the profits of the iron works and the wages of their employes, a return to last year's prices or anything like them cannot be expected. Indeed, it is questionable if the American works will not have trouble in meeting the cost of importation, even with very moderate profits. They will doubtless do it, however, and it is probable that hereafter imports will be very greatly diminished, and that the American works will substantially supply the home demand, though for the rest of this year the chief profit in the business may go to those who supply the ore and not to those who manufacture the iron.

THE SOUTHWESTERN RAILWAY ASSOCIATION has been in trouble again, and, according to a telegram from Chicago, Tuesday, is already out of it. This time, as last winter, the Missouri Pacific was charged with making the trouble, and perhaps it will be well to bear in mind that all the information concerning the matter comes from the other roads. Last winter, when there was difficulty before, the Missouri Pacific refused to turn over a balance due from it to the Chicago & Alton for excess of freight carried to St. Louis. By the apportionment then in force each of the three roads was to have one-third of the traffic. After much wrangling and great fear that the Association would be destroyed, there was a new apportionment by arbitration by which the Chicago & Alton's proportion was reduced to 25 per cent., and the Missouri Pacific's increased to about 41 per cent. From this award the Chicago & Alton and the Wabash appealed; but pending the appeal it appeared that the Missouri Pacific was carrying very much more than even the large proportion awarded it. This was effected, it is said, by giving rates on freight billed through from points on the Central Branch and Kansas Pacific roads about one-half the regular rate from Kansas City to St. Louis. To meet this the other roads announced equal rates on shipments made at Kansas City and other Missouri River points, and a lively war on traffic, from Missouri River points to Mississippi River points, was actually begun, the rate being reduced from 15 cents to 6. But Tuesday's telegram says that a settlement was made that day, the Missouri Pacific restoring rates on freight billed through from points west of the Missouri River, and the Chicago & Alton and the Wabash withdrawing their appeal and accepting as final the percentages of traffic awarded them. But it is hard to put faith in the permanency of any agreement after such a treatment of the previous one.

The new award in the Chicago Division of the Association gives the Rock Island 25.35 instead of 22.26, the Chicago & Alton 28.50 instead of 28.38, and the Burlington 46.15 instead of 49.36 per cent. of the traffic.

THE ARGUMENT FOR STATE RAILROAD OWNERSHIP was probably never put more completely and compactly than in the document which the Prussian government submitted to the Parliament of that country last fall when it applied for authority to purchase a number of important railroads, with the avowed purpose of making the Prussian railroad system an exclusively state system. We begin this week a translation of this document, which will repay careful perusal, and has more significance in this country than might be expected, considering the fact that no one here thinks of making a government railroad system. At this stage of the publication we will only call attention to two features of this argument: one is a statement of the inefficiency of state supervision, made by a government which has exercised such supervision for forty years with great thoroughness and minuteness, and through an admirably trained corps of expert officials, who are probably as trustworthy a body as ever served any government. The other is the demonstration, which will be made stronger in the rest of the argument, of the great advantages of unity of management in all those matters in which two or more roads have to work together—advantages which we consider incontestable. It is certainly true that the only way in which it is possible to get the maximum benefit from the railroads is by working them as one system; and though it is questionable whether this will ever be effected, even where the railroads are all owned by the state, we are making decided progress in that direction; and there is good reason to hope that the free development of the railroads in this country will finally result in the attainment of unity in those matters in which unity is required, while leaving intact the individuality of the separate lines in other matters—which is also of very great importance and advantage—which may be very much better than a state system in any country, and infinitely better than such a system could be in this country, at least in this generation.

WATER RATES are lower, the chief reduction being on the Canal. Lake rates are unchanged at 3 cents for corn and 3½ for wheat from Chicago or Milwaukee to Buffalo. One of the events of the week was the shipping of three propeller loads of wheat to go by lake and rail, at 14 cents per bushel to New York and 16 to Boston. Before this, scarcely any wheat had been shipped by lake this season. The canal rate fell

little by little from 6½ cents for corn and 7 for wheat (the opening rate) to 6 and 5½ on Tuesday last. For corn 5½ was asked Wednesday, but a break in the canal has interrupted the canal movement for about a week. Ocean rates have been going down for about two weeks, or rather they began to go down about two weeks ago, and within about a week fell from 7d. to 4½d. per bushel. This week shipments have been made as low as 4d., and Wednesday's contracts are reported at 4d. and 4½d. It now costs about 10 cents a bushel to get a bushel of corn from Chicago to New York by lake and canal, against 16.8 cents by rail. With this difference heavy rail shipments by rail to the seaboard cannot be expected, at least from places near lake ports. But the shipment of large quantities of wheat by lake and rail at 14 cents, with the lake and canal rate 11 cents and the all-rail rate 18 cents indicates that a considerable difference in rates will not prevent a rail movement even in export grain. The railroads get, on this lake-and-rail grain, their proportion of the Chicago all-rail rates, but this movement is just as injurious to the railroads west of Buffalo and Erie as that by lake and canal.

THE NEW YORK FREIGHT LAW, prohibiting discriminations in the charges for carrying freight, passed the Lower House of the Legislature last Wednesday by a vote of 81 to 32. It prohibits giving rates to one party lower than those charged another for similar service, and no allowance may be made for quantity shipped greater than a car-load—that is, every one must have the same car-load rate for the same hauls. Another provision, which, in case of a railroad war like those of 1876, 1878 and 1879, would seriously cripple the New York roads in their competition with railroads outside of the state, is that the rate for any distance on the same road may not exceed that for a greater distance on the same road. The result of this, in case of a desperate railroad war, would be that when through rates were reduced below cost, the New York roads would have to carry all their freight without profit, while their rivals out of the state would be making a profit on their local traffic which would go far toward supporting them in their contest. The bill will now go to the Senate.

Standard Cars for the Vanderbilt Lines.

In February a meeting was held in New York of the master car-builders of the Vanderbilt lines, for the purpose of establishing a standard system of cars. After fixing upon the general features of such cars the meeting adjourned, with the understanding that each of the delegates should build a specimen car, to be submitted for inspection at a meeting to be held later. This adjourned conference was held last week at Buffalo, to which point the new cars were sent. The following account of the meeting was furnished by the Secretary of the meeting to the *Buffalo Commercial Advertiser*. It will be seen that the Erie and some other non-Vanderbilt roads had representatives present:

"The Committee visited East Buffalo yesterday (April 21) and examined the model cars ordered at the preliminary meeting. The New York Central showed a local box, a stock, a cattle, a 34-ft. star lumber, a 20-ton flat, a gondola, and a 4-wheel box-car; the Michigan Central a 20-ft. box and two 34 ft. box-cars; the Flint & Pere Marquette a 4-wheel box-car; the Lake Shore & Michigan Southern a 20-ft. box, a 34-ft. box and a flat car; the Canada Southern a plain box-car. A large number of gentlemen interested besides the Committee inspected the cars, and all the points were studied. The Committee will probably decide on standard box lumber, cattle, coal and flat cars. There are, however, several points that it is impossible to adjust until some of the master car-builders return home. Within two or three weeks plans and specifications will be prepared in accordance with the Committee's ideas, and all new cars, or old ones sent to the shops for repair, will be constructed or altered according to the standard rules. We are rushing this matter through in order to have all the details arranged in time for the next annual Convention of Car-Builders, to be held in Detroit in June."

It was decided to adopt an iron truck, the Hewitt journal-box lid, an iron transome to be made of channel iron or its equivalent, and a continuous draw-bar.

The following gentlemen were present at the meeting: Leander Garey, Chairman, New York; New York Central & Hudson River Railroad and New York & Harlem Railroad.

D. M. Brady, Secretary, New York; same roads. John Kirby, General Master Car-Builders, Lake Shore & Michigan Southern.

John Orton, General Master Mechanic, Canada Southern. Robert Miller, Master Car-Builders, Michigan Central.

E. H. Olmstead, Master Car-Builders, Western Division New York Central.

David Hoyt, Master Car-Builders, Eastern Division New York Central.

C. E. Garey, Master Car-Builders of Harlem Railroad.

J. H. F. Weirs, General Master Mechanic New York, Pennsylvania & Ohio.

Frank Wilder, Superintendent of Motive Power New York, Lake Erie & Western.

Milton Wilder, Master Car-Builders Western Division New York, Lake Erie & Western.

Sanford Keeler, General Superintendent Flint & Pere Marquette.

James Withycome, Master Car-Builders Lake Shore & Michigan Southern, Buffalo Division.

William P. Taylor, General Manager Canada Southern.

George H. Burrows, Superintendent Western Division New York Central.

William B. White, Master Car-Builders Central Division New York Central.

F. O. Bray, Division Master Car-Builders Lake Shore & Michigan Southern.

J. W. Musson, General Manager Canada Southern Line.

John S. Lenz, Master Car-Builders Lehigh Valley.

Thomas West, Master Mechanic Buffalo Division New York, Lake Erie & Western.

E. E. Carver, Master Mechanic Canada Southern.

Peter C. Doyle, General Northern Freight Agent Lehigh Valley.

Joseph Taylor, Secretary, and John MacBeager, Superintendent of the Michigan Car Works, Detroit.

C. R. Woodin, of the firm, and Jacob Claussan, Superintendent of the Jackson & Woodin Company, of Berwick, Pa.

Allen Middleton, of the Middleton Spring Company, Philadelphia.

A. French, Pittsburgh.

J. E. French, Cleveland, of the Winslow Car Roofing Co.

RAILROAD EARNINGS IN MARCH.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1880.	1879.	Inc.	Dec.	Per c.	1880.	1879.	Increase.	Decrease.	Per c.	1880.	1879.	Increase.	Decrease.	Per c.
Alabama Gt. Southern	290	290				\$ 47,829	\$ 33,152	14,677			\$ 165	\$ 114			
Atchison, Topeka & Santa Fe	1,152	894	258		29.0	668,000	508,609	159,391			31.3	580			
Burlington, Cedar Rapids & North	492	434	58		13.4	188,324	111,924	76,400			88.3	383			
Cairo & St. Louis	146	146				30,079	10,090	19,989			52.7	206			
Canada Southern	468	468				409,189	226,378	182,811			80.7	874			
Central Pacific	2,335	2,180	155		7.1	1,250,000	1,280,272		30,272		2.4	535			
Chesapeake & Ohio	435	435				222,749	132,172	90,577			88.5	512			
Chicago & Alton	440	478	102		23.9	602,624	327,370	275,254			84.1	717			
Chicago & Eastern Illinois	159	159				88,278	67,025	21,253			31.7	553			
Chi., Clinton, Dub. & Minn.	222	222				53,817	42,683	11,134			26.1	242			
Chicago, Milwaukee & St. Paul	2,359	1,772	587		33.1	901,000	632,896	268,104			42.4	382			
Chicago & Northwestern	2,289	2,159	130		6.0	1,395,000	1,107,042	287,958			25.8	609			
Chicago, St. Paul & Minn.	178	178				114,808	89,410	25,398			28.4	645			
Chi. & West Michigan	245	245				71,444	54,916	16,528			30.1	292			
Cincinnati, Sandusky & Cleve.	190	190				54,634	47,356	7,278			15.4	288			
Cleve., Col., Cin. & Ind.	472	472				368,415	272,963	95,452			35.0	781			
Cleveland, Mt. Vernon & Del.	157	157				36,202	27,073	9,129			29.4	231			
Denver, South Park & Pacific	147	85	62		72.9	195,704	41,366	154,338			372.8	1,331			
Detroit, Lansing & No.	209	201	8		4.0	107,232	77,844	29,388			37.8	513			
Flint & Pere Marquette	295	280	15		5.3	147,013	98,427	48,586			40.4	498			
Hannibal & St. Joseph	292	292				216,327	211,899	4,428			2.1	741			
Illinois Central, Illinois lines	873	854	19		2.2	475,324	400,159	75,165			18.8	544			
Iowa lines	402	402				144,671	132,001	12,670			9.6	300			
Ind., Bloom. & Western	212	212				116,185	80,587	35,598			44.2	548			
International & Great Northern	526	516	10		1.9	117,563	122,567		4,504		3.7	224			
Kan. City, Ft. Scott & Gulf	176	160	16		10.0	98,196	62,839	35,357			53.1	347			
Little Rock & Fort Smith	165	165				33,000	23,414	9,586			41.0	200			
Louisville & Nashville	1,118	973	145		14.9	606,105	421,579	184,526			43.8	542			
Memphis, Pad. & No.	115	115				17,044	12,542	4,502			43.2	150			
Minneapolis & St. Louis	158	123	35		28.5	48,544	34,799	13,745			39.5	307			
Missouri, Kansas & Texas	848	780	68		7.9	355,508	224,559	130,949			58.3	419			
Mobile & Ohio	506	527			21	168,669	162,740	5,929			3.6	333			
N. Y. Central & Hudson River	1,018	1,018				2,854,835	2,474,392	380,443			15.4	2,804			
N. Y. & New England	275	275				181,751	151,737	30,014			19.8	601			
Northern Central	326	326				418,325	354,193	64,132			24.3	1,274			
Northern Pacific	644	644				119,573	108,075	10,598			9.7	186			
North Wisconsin	70	62	8		12.9	17,762	7,993	9,769			122.1	254			
Ogdensburg & Lake Cham.	122	122				30,339	20,556	9,783			47.5	249			
Paducah & Elizabethtown	185	185				29,578	22,905	7,673			33.2	160			
Pennsylvania	1,896	1,716	180		5.2	3,278,186	2,603,068	675,118			25.9	1,815			
Peoria, Decatur & Evansville	117	117				20,695	14,443	15,252			105.9	254			
Philadelphia & Reading	926	800	126		15.8	1,457,322	1,041,142	416,180			40.0	1,574			
St. L., Al. & T. H. Main Line	195	195				116,424	71,121	45,303			53.3	586			
St. L., Al. & T. H. Belleville	71	71				54,620	44,887	9,733			21.7	770			
St. Louis, Iron Mt. & Southern	685	685				450,620	353,147	97,473			27.6	658			
St. Louis & San Francisco	528	328	200		61.0	197,470	95,296	102,174			107.2	374			
St. Paul & Duluth	175	169	6		3.5	37,806	27,808	9,998			39.2	217			
St. Paul & Sioux City	470	329	141		42.9	118,138	94,378	23,760			25.2	251			
Scioto Valley	100	100				28,005	24,579	3,426			13.9	280			
Toledo, Peoria & Warsaw	237	237				128,453	91,257	37,196			40.7	542			
Union Pacific	1,833	1,821	12		0.6	1,739,000	1,301,000	438,000			33.7	938			
Wabash, St. L. & Pacific	1,558	1,217	341		28.0	932,480	655,480	277,000			32.4	549			
Wisconsin Valley	107	90	17		18.9	33,369	14,590	18,779			127.9	311			
Total, 53 roads	29,939	27,277	2,662		21	21,643,210	16,640,069	5,003,141	\$34,770		723	610			
Total increase			2,662		9.0			5,002,541			30.1				

RAILROAD EARNINGS, THREE MONTHS ENDING MARCH 31.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.					
	1880.	1879.	Inc.	Dec.	P. c.	1880.	1879.	Increase.	Decrease.	P. c.	1880.	1879.	Inc.	Dec.	P. c.	
Ala. Gt. Southern.....	290	290				\$ 154,457	\$ 100,187	\$ 54,270			\$ 533	\$ 345			54.2	
Atch., Top. & S. F.....	1,152	890	263		29.6	1,585,500	1,192,447	393,053			33.0	1,376	1,341	35	2.6	
Burr., Ced. Rap. & No.	492	434	58		13.4	537,811	326,563	211,248			64.7	1,093	765	328	42.9	
Cairo & St. Louis.....	146	146				78,203	54,177	24,026			44.3	536	165	371	44.3	
Canada Southern.....	468	468				1,003,702	611,483	392,219			64.1	2,145	1,307	838	64.1	
Central Pacific.....	2,335	2,180	155		7.1	3,488,614	3,430,129	58,485			1.8	1,494	1,572	78	5.0	
Chesapeake & Ohio.....	435	435				623,765	392,916	300,849			93.2	1,438	742	696	93.2	
Chicago & Alton.....	840	678	162		23.9	1,623,692	978,788	644,904			65.9	1,923	1,444	489	33.9	
Chi. & Eastern Illinois.....	159	159				244,009	195,585	48,424			24.8	1,535	1,230	305	24.8	
Chi., Clinton, Dub. & M.	222	222				160,979	120,593	40,386			33.5	775	543	182	33.5	
Chi., Mil. & St. Paul.....	2,359	1,772	587		25.4	2,403,000	1,700,737	702,263			41.3	1,019	976	43	4.4	
Chicago & Northwestern	2,289	2,159	130		6.0	3,681,315	3,004,986	676,329			22.5	1,609	1,392	217	15.6	
Chicago, St. Paul & Minn.	178	178				275,915	227,852	48,063			21.1	1,550	1,280	270	21.1	
Chi. & West. Mich.....	245	245				190,396	144,550	45,846			31.7	777	590	187	31.7	
Cleve., Col., Cin. & Ind.	472	472				1,136,865	857,591	279,274			32.6	2,408	1,816	592	32.6	
Cleveland, Mt. V. & Del.	157	157				104,131	80,505	23,626			29.2	693	513	180	29.2	
Denver, S. Park & Pa	147	85	62		72.9	475,434	91,805	383,569			417.5	3,234	1,081	2,153	190.3	
Detroit, Lansing & No.	204	201	3		1.5	207,118	199,048	68,070			34.2	1,300	960	319	32.2	
Flint & Pere Mar.....	295	282	13		4.4	375,040	253,360	121,680			48.0	1,271	905	366	44.4	
Grand Trunk.....	1,273	1,390			117	8.4	2,400,432	2,192,585	207,847			13.6	1,956	1,577	379	24.0
Great Western.....	526	526				1,190,295	1,073,214	117,081			10.9	2,263	2,040	223	10.9	
Hannibal & St. Jo.....	292	292				549,972	485,984	63,988			13.2	1,883	1,604	219	13.2	
Ill. Cen., Ill. lines.....	873	854	19		2.2	1,355,233	1,244,618	110,615			8.9	1,552	1,457	95	6.5	
Ind. Cen., Iowa lines.....	402	402				384,230	334,656	49,575			14.8	956	832	124	14.8	
Ind., Bloom. & West.....	212	212				286,043	246,473	40,170			16.3	1,352	1,163	189	16.3	
Inter. & Gt. Northern.....	526	516	10		1.9	415,583	341,241	74,342	15,638		3.6	790	836	46	5.6	
Kan. C'y, Ft. S. & Gulf	176	160	16		10.0	285,036	178,114	106,922			60.0	1,620	1,149	471	45.6	
Little Rock & Ft. S.....	165	165				122,286	72,011	50,275			69.8	741	436	305	69.8	
Louisville & Nash.....	1,118	973	145		14.9	1,830,474	1,302,693	527,781			40.5	1,637	1,339	298	22.2	
Mem., Paducah & No.....	115	115				54,038	41,121	12,917			31.4	470	358	112	31.4	
Minn. & St. Louis.....	158	123	35		28.5	139,694	90,427	49,267			54.5	884	735	149	29.3	
Missouri, Kan. & Tex.	838	780	52		6.6	1,050,808	613,867	436,941			71.2	1,254	781	473	60.6	
Mobile & Ohio.....	506	527			21	622,085	527,886	94,199			17.8	1,229	1,092	227	22.2	
N. Y. C. & Hud. R.....	1,018	1,018				7,765,679	6,709,508	1,056,171			15.7	7,628	6,591	1,037	15.7	
N. Y. & New England.....	275	275				495,890	398,625	97,265			24.4	1,803	1,449	354	24.4	
Northern Central.....	326	326				1,080,679	872,773	207,906			23.8	3,315	2,677	638	23.8	
Northern Pacific.....	644	644				257,835	190,647	67,188			35.3	400	296	104	35.3	
North. Wisconsin.....	70	62	8		12.9	55,061	22,397	32,664			145.8	787	361	426	118.8	
Ogdensburg & L. Cham	122	122				88,813	59,857	28,956			48.3	778	491	237	48.3	
Pad. & E'town.....	185	185				92,263	69,300	22,963			33.1	499	375	124	33.1	
Pennsylvania.....	1,806	1,716	90		5.2	9,306,314	7,684,532	1,621,782			21.1	5,153	4,478	675	15.5	
Phila. & Reading.....	926	860	126		15.8	3,836,720	2,674,223	1,162,497			31.4	4,143	3,385	748	15.5	
St. L., A. & T. H. B. L'd	195	195				305,007	297,606	11,401			50.4	1,354	1,034	322	50.4	
St. L., A. & T. H. B. Line	71	71				159,720	137,720	22,000			43.6	2,550	1,938	612	43.6	
St. L. Iron Mt. & So.	985	985				1,496,798	1,026,337	470,461			45.8	2,185	1,498	687	45.8	
St. Louis & San Fran.	520	328	192		58.5	592,809	260,744	332,065			127.4	1,140	795	345	43.3	
St. Paul & Duluth.....	175	169	6		3.5	109,301	73,886	35,415			47.9	625	437	188	43.3	
St. Paul & Sioux City.	470	329	141		42.9	314,031	234,809	79,132			33.7	698	714	46	6.1	
Scioto Valley.....	100	100				69,768	65,739	4,032			6.1	698	657	41	6.1	
Toledo, Peoria & W.....	237	237				326,660	263,788	62,872			23.9	1,379	1,113	266	23.9	
Union Pacific.....	1,313	1,302	11		0.8	3,619,097	2,769,302	850,095			32.2	2,757	2,104	653	31.8	
Wab., St. L. & Pacific.	1,531	1,217	334		27.4	2,535,486	1,892,210	643,276			33.6	1,628	1,417	211	8.1	
Wisconsin Valley.....	107	90	17		18.9	76,652	34,165	42,487			124.2	716	380	336	88.8	
Total, 53 roads.....	30,861	28,332	2,667	138		61,766,238	48,464,181	13,317,715	15,658		2,001	1,711	290	16.6	16.6	
Total increase.....			2,529		8.9			13,302,057			27.4					

Jackson, E. C. Morrison, Theodore Moss; Secretary and Treasurer, Eugene M. Jerome.

Kansas City, Burlington & Santa Fe.—The new board has elected officers as follows: President, Wm. H. Schofield, Burlington, Kan.; Vice-President, John C. Short, New York; Secretary and Treasurer, Orson Kent, Burlington, Kan.; Executive Committee, J. P. Hale, Thomas Rutter, H. S. Chandler, Charles Place, George Moore, G. W. Debevoise, Henry A. Brown.

Miami Valley.—This company has elected A. D. Bullock President; George Hafer, Secretary and Treasurer.

New England General Passenger Agents' Association.—The following officers have been elected for the ensuing year: President, Lucius Tuttle, Eastern Railroad; Vice-President, George L. Connor, Old Colony; Secretary, C. P. Waite, Worcester & Nashua.

New York, Lake Erie & Western.—Mr. Charles W. Smith, for many years General Traffic Manager of the Chicago, Burlington & Quincy Railroad, is appointed to the same position on the New York, Lake Erie & Western, which has not heretofore had such an office; but the duties of it, or a large part of them, have been discharged by Mr. George R. Blanchard, Assistant to the President. Mr. Blanchard, it is understood, will generally continue to represent the company in negotiations with other companies, etc. Mr. Smith assumes his position May 1. Before he came to the Burlington road he was General Manager of the Indianapolis, Bloomington & Western and before that for a time General Freight Agent of the Central Pacific. His apprenticeship to railroad business was on the Columbia, Piqua & Indiana Railroad, where he was agent first at Woodstock and then at Columbus, rising in about two years to be General Freight Agent, which place he held about twelve years, at the end of which time by consolidations, etc., his road had become the Pittsburgh, Cincinnati & St. Louis, then working about a thousand miles of road. For one of these years, however, he acted as freight agent of the Erie in Chicago.

It is rumored that Mr. R. C. Vilas, for many years General Freight Agent of the Erie, and esteemed a most capable and efficient officer, for whom railroad men outside of his own road as well as his fellow-officers in it profess a very high regard, contemplates resigning his position.

Mr. O. W. Marsh has been appointed New England Passenger Agent, with office in Boston, in place of James A. Farley, deceased.

Mr. George S. Shepard has been appointed General Agent of the Erie & Boston line. He has been General Agent at Elmira for several years.

New York, Pennsylvania & Ohio.—The general freight office of this company was removed from Cincinnati to No. 393 Euclid avenue, Cleveland, Ohio, Saturday, April 24, and all communications for this department should be addressed accordingly.

New York, Ridgeway & Pittsburgh.—This company has been temporarily organized by the election of the following: President, Charles R. Farley; Directors, Andrew G. Curtin, Wm. M. Stewart, Eugene Quackenbush, Windsor Gordon; Secretary, Lucius Regan.

Pemberton & Hightstown.—At the annual meeting in Hightstown, N. J., last week, the old officers were re-elected, as follows: Nathaniel S. Rue, President; James W. Allen, Vice-President; James L. Rue, Secretary; Collin B. Meirs, Treasurer. The road is leased to the Pennsylvania Railroad Company.

Pennsylvania.—Mr. Thomas A. Roberts has been appointed Superintendent of the Bedford Division, in place of Persifer F. Smith, resigned. Mr. Wm. M. Phillips succeeds Mr. Roberts as Assistant Engineer of Maintenance of Way of the Philadelphia Division.

Pittsburgh & Lake Erie.—Mr. E. D. Nettleton has been appointed General Agent of the Freight Department. All matters concerning the General Freight Department should be referred to him. Mr. Nettleton was, until April 1, General Freight Agent of the Allegheny Valley road.

St. Louis, Salem & Little Rock.—At the annual meeting in Salem, Mo., April 8, the following directors were chosen: J. M. Orchard, Salem, Mo.; H. A. Crawford, St. Louis; A. L. Crawford, New Castle, Pa.; Joseph McCarter, Wm. Scott, Erie, Pa. The board re-elected A. L. Crawford President; H. A. Crawford, Vice-President and Purchasing Agent; Wm. Brewster, Secretary and Treasurer; E. L. Foote, Assistant Secretary and Treasurer; E. B. Sankey, Superintendent and General Freight Agent; Thomas Everson, Master Mechanic.

Southern Railway & Steamship Association.—The new Board of Arbitrators is composed of Messrs. W. R. Arthur, formerly General Manager of the St. Louis, Iron Mountain & Southern; Thomas H. Carter, late Railroad Commissioner of Virginia, and John Screven, formerly President of the Atlantic & Gulf.

Texas & Pacific.—Mr. R. C. Peebles has been appointed Chief Engineer of Maintenance of Way, with office in Marshall, Tex. He has been for several years Superintendent of the Summit Branch road.

Toledo, Delphos & Burlington.—Col. Philip D. Fisher (formerly Chief Engineer of the Columbus & Toledo) has been appointed Consulting Engineer of this road. Mr. Walter Sherman still remains Chief Engineer.

Tonawanda Valley.—The officers of this new company are: President, R. G. Taylor; Vice-President, R. H. Farnham; Secretary, J. V. D. Loomis; Treasurer, B. W. Spencer. Mr. Spencer is Treasurer, and Mr. Taylor Division Superintendent of the New York, Lake Erie & Western.

Western Union Telegraph.—Gen. Anson Stager having resigned the office of General Superintendent, while continuing to hold that of Vice-President of the company, Mr. L. C. Clowry has been appointed General Superintendent.

PERSONAL.

—Rt. Hon. Hugh C. E. Childers, formerly President of the Great Western Railway Company of Canada, goes into the new English Cabinet as Secretary of State for War.

—Mr. Persifer F. Smith, Superintendent of the Bedford Division, Pennsylvania Railroad, has resigned, to accept the position of President of the Wellsville Plate & Sheet Iron Company.

—The late Judge Asa Packer is to be commemorated by a bronze statue of heroic size, which will be placed in front of Packer Hall in the grounds of the Lehigh University at Bethlehem.

—Mr. C. W. Smith, whose resignation as Traffic Manager of the Chicago, Burlington & Quincy was noted last week, will, it is said, accept a similar position on the New York, Lake Erie & Western road.

—Mr. Hugh Wick, an old citizen of Youngstown, O., and a director of the Shenango & Allegheny Company, died

April 22, aged 71 years. He was largely interested in coal and iron enterprises in the Mahoning Valley.

—Mr. Sidney W. Beers, General Passenger Agent of the New Jersey Midland road, died last week at his father's house in Norwalk, Conn. He had been connected with the Midland in various capacities from its beginning.

—Mr. H. J. Small, Master Mechanic of the Texas & Pacific road was married recently to Miss Mary Blanche, of Marshall, Tex. The lady's parents were much opposed to the match, but Mr. Small carried off his bride in spite of all opposition.

—Mr. Hugh C. E. Childers, who was for several years and until about a year ago President of the Great Western Railway Company, of Canada, and as such made some interesting speeches concerning American railroad policy at the shareholders' meeting, becomes Secretary of State for War in the new Gladstone Ministry.

—Mr. Amos Pillsbury has resigned his position as Master Mechanic of the Hartford Division of the New York & New England road, to take effect April 30. Mr. Pillsbury has been connected with the Hartford shops for 26 years, and for many years was General Foreman under Master Mechanic Garfield. When Mr. Garfield died two years ago Mr. Pillsbury was made Master Mechanic in his place, and when the Hartford, Providence & Fishkill road was transferred to the New York & New England last year he was retained in charge of the division.

—Mr. Joseph Seligman, head of the great banking house of J. & W. Seligman & Co., of New York, died suddenly April 25, in New Orleans, while on a visit to one of his daughters. Mr. Seligman was the oldest of eight brothers who are all in the New York house or its branches in London, Paris and Frankfurt. He was born in Bavaria in 1819, and came to this country in 1838, settling in New York ten years later. He at first engaged in the clothing business with several of his brothers, but they gave it up and started the banking house in 1863. The house and its operations in railroad and government securities are widely known. Mr. Seligman was very largely interested in the Atlantic & Pacific and its successor the St. Louis & San Francisco, the Missouri & Western, the New York City & Northern and other roads, and was a director in several companies.

—Mr. Peter Weiler, a somewhat eccentric old man of large property, committed suicide by hanging at his residence in Woodside, N. J., April 25. He is remembered by Erie men for his fight with James Fisk, Jr., in which Fisk came out second best. The Newark Branch of the Erie was built across Mr. Weiler's land in Woodside, and when his claim for damages was not paid he pressed it pertinaciously. For some reason or other, Fisk took a notion not to pay it, and Mr. Weiler procured an injunction, preventing the running of trains over his land until it was paid for. Threats and persuasions of every kind were brought to bear, with no effect; the old man was determined to have his money, and no trains were run over the branch for several months. Fisk threatened to open the road forcibly, but only threatened, for he had learned that New Jersey courts could not be trifled with, and finally he yielded and Mr. Weiler was paid in full.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Three months ending March 31:

	1880.	1879.	Inc. or Dec.	P. c.
Maine Central.....	\$308,562	\$322,792	I.	\$45,770 14.0
Northern Central.....	1,080,079	872,776	I.	307,003 28.8
Net earnings.....	378,254	309,300	I.	69,054 22.3
Pennsylvania.....	3,066,314	7,684,532	I.	4,618,218 151.1
Net earnings.....	4,109,528	3,179,541	I.	929,987 29.2

Two months ending Feb. 29:

Atlanta & Charlotte Air Line.....	\$168,287	\$121,088	I.	\$40,500 38.3
Month of February:				
At. & Charlotte Air Line.....	\$85,809	\$63,979	I.	\$21,920 34.3

Eastern.....	\$238,950	\$188,243	I.	\$50,707 27.0
Maine Central.....	141,500	127,080	I.	14,420 11.4
Pennsylvania.....	3,278,186	2,603,068	I.	675,118 25.9
Net earnings.....	1,511,248	987,223	I.	524,025 53.1

Second week in April:				
Chicago & Alton.....	\$132,906	\$88,415	I.	\$44,491 50.3
Flint & Pere Marquette.....	32,270	22,700	I.	9,570 42.2
Minn. & St. Louis.....	6,029	6,031	I.	1,008 15.9
Mobile & Ohio.....	35,224	28,538	I.	6,686 23.5

Third week in April:				
Mo. Kansas & Texas.....	\$77,980	\$44,147	I.	\$33,833 70.7
Wabash, St. L. & P.....	224,137	140,747	I.	83,390 59.3

Week ending April 16:				
Great Western.....	\$90,690	\$81,949	I.	\$8,741 10.6

Week ending April 17:				
Grand Trunk.....	\$196,418	\$171,024	I.	\$25,394 14.9

Grain Movement.

For the week ending April 17, receipts and shipments of grain of all kinds at the eight reporting Northwestern markets, and receipts at the seven Atlantic ports, have been in bushels, for the past seven years:

	Northwestern receipts.	Total.	By rail.	By water.	Atlantic receipts.
1874.....	3,164,579	4,038,359	1,399,180	34.7	2,519,729
1875.....	2,667,509	1,280,426	1,119,426	87.4	1,737,957
1876.....	2,000,581	2,867,642	1,616,449	56.4	2,685,473
1877.....	2,517,399	2,398,531	1,881,480	84.9	2,321,586
1878.....	4,030,022	3,592,016	739,316	21.1	2,860,653
1879.....	2,503,486	3,250,090	100.0	5,089,829
1880.....	3,064,067	3,805,446	1,492,295	39.2	5,037,852

The receipts of the Northwestern markets are 12 per cent. less than the preceding week, and, with the exception of one week last February and one last January, are the smallest for a year, yet a fifth larger than in the corresponding week of last year. The shipments of these markets were not quite half as large as in the week preceding, but the rail shipments were but a ninth smaller. The rail rate was reduced in the middle of the week. The Atlantic receipts were the smallest for four weeks, and a little less than in the corresponding week of last year, but larger than in the corresponding week of any other year.

Of the receipts at Northwestern markets, Chicago had 29.5 per cent., Toledo, 24.7; St. Louis, 22.2; Peoria, 13; Detroit, 5.1; Milwaukee, 3.8, and Cleveland, 1.7 per cent. Toledo and St. Louis have unusually large proportions, and Milwaukee a remarkably small one of the whole receipts.

Of the receipts at Atlantic ports New York had 27.8, Baltimore 26.8, Philadelphia 17.7, New Orleans 14, Boston 11.9, Portland 1.4, and Montreal 0.4 per cent. New York's receipts are the smallest for six weeks, Boston's the largest since November; those of New Orleans have been exceeded but once this year, and but a few times ever before.

The exports from Atlantic ports for four successive weeks have been:

	April 21.	April 14.	April 7.	March 31.
Flour, bbls.....	91,014	50,917	58,606	35,630
Grain, bush.....	4,748,482	4,386,366	5,299,033	4,099,295

The proportion of wheat in these exports has increased, but corn continues to be the chief grain exported, and in the four weeks the shipments of it have been 11,000,000, against 6,740,000 of wheat.

Petroleum.

Stowell's Petroleum Reporter gives the production of the Pennsylvania oil regions for March as follows, in barrels of 42 gallons:

	1880.	1879.	Increase.	P. c.
Production.....	2,022,592	1,469,315	553,187	34.9
Shipments.....	1,613,371	973,879	639,492	65.6
Stock, March 31.....	9,482,693	6,318,060	3,164,594	50.1
Number of producing wells.....	12,222	10,692	1,530	14.3

Pittsburgh receipts of crude oil for the month were 25,244 barrels by pipe line and 3,346 barrels by Allegheny Valley Railroad. Shipments and home sales of refined oil were equivalent to 28,705 barrels of crude. Pittsburgh stock, March 31, was 767,974 barrels.

Coal Movement.

Coal tonnages for the week ending April 17 are reported as follows:

	1880.	1879.	Increase.	P. c.
Anthracite.....	610,023	475,279	134,744	28.8
Semi-bituminous.....	81,105	71,286	9,819	13.8
Bituminous, Penna.....	68,106	44,162	23,944	54.1
Coke, Pennsylvania.....	46,250

The Cumberland mines are now fully at work. The Clearfield mines are resuming gradually, but production increases very slowly.

Lumber Rates.

An adjourned meeting to fix rates on lumber was held in Chicago, April 23, the roads represented being the Cincinnati, Sandusky & Cleveland; Lake Shore & Michigan Southern; Pennsylvania Company; Flint & Pere Marquette; Detroit, Lansing & Northern; Cincinnati, Hamilton & Dayton; Grand Rapids & Indiana; Fort Wayne & Jackson; Lake Erie & Western; Baltimore & Ohio; Pittsburgh, Cincinnati & St. Louis; Wabash, St. Louis & Pacific; Chicago & West Michigan; Detroit, Grand Haven & Milwaukee; Louisville, New Albany & Chicago; Columbus & Toledo, and the Green Line. Mr. D. W. C. Brown was Chairman, and Mr. Ludlow Secretary.

The discussion begun at the previous meeting on the adoption of 100 lbs. or 1,000 ft. as a basis for rates was continued. Finally a compromise was effected, whereby lumber will be carried during the coming month at the rates which were in force last autumn, the measurement to be according to the 100 lbs. system. This experiment will be tried for one month at the end of which another meeting will be held in Cincinnati, for the purpose of a final agreement.

The meeting then adjourned until May 18, at Cincinnati.

Southwestern Railway Association.

All sorts of reports have been current about the trouble in this Association, but it is finally announced that the Missouri Pacific has consented to make good to the other companies its surplus of tonnage. It was this surplus tonnage which caused the trouble, the other St. Louis companies claiming that it had been secured by cutting rates and other under-hand practices.

THE SCRAP HEAP.

Railroad Equipment Notes.

The Rochester Car Wheel Works, at Rochester, N. Y., owing to the increased demand, have enlarged the capacity of their works to 150 wheels per day. They are filling orders from many prominent roads in New York and other states. The Taunton (Mass.) Locomotive Works are filling an order for heavy engines for the Union Pacific road.

The Brooks Locomotive Works, at Dunkirk, N. Y., are building 15 engines for the New York, Lake Erie & Western, and have other orders on hand. An extension is being put up to the blacksmith shop, to accommodate another steam hammer.

The Pittsburg, Cincinnati & St. Louis shops, at Columbus, O., are building four shifting engines for use on the road. They are tank engines with six wheels connected.

The Pullman Car Shops at Detroit have just turned out some very handsome sleeping cars to run on the Cincinnati Southern road.

The Cleveland Bridge & Car Works have orders for 700 freight cars on hand and the car shops employ nearly 400 men.

The Chicago, Burlington & Quincy shops at Aurora, Ill., are full of work. The standard driving wheel patterns on this are 57 in. in diameter, the cast-iron centre weighing 2,200 lbs., and 63 in., weighing 2,500 lbs. The tires now used are steel, from the Midvale Works.

Iron and Manufacturing Notes.

The Western Wheel Scraper Co., at Mt. Pleasant, Ia., in addition to orders filled earlier in the season, has orders for a car-load of scrapers to go to Texas, a car-load to St. Louis, a car-load to Dakota, three car-loads to Oregon and a number of smaller orders, all of which will be filled in a short time.

The Catawba Furnace property, in Botetourt County, Va., has been sold to parties from Ohio, who intend to put the furnace in blast soon.

The Novelty Iron-Works, in Cleveland, O., are filling a large order for frogs and crossings for the New York, Pennsylvania & Ohio road.

The Capon Furnace property, in West Virginia, has been leased to Bunting & Kesler, of Philadelphia, who are preparing to start the furnace.

Virginia iron ores are attracting notice. The Pennsylvania Steel Co. is mining largely in Pittsylvania County near the Virginia Midland road, and Col. Scranton, of Oxford, N. J., has opened a mine in Culpeper County, near the same road. Other mines are to be opened in Pittsylvania County and in the James River iron district.

The James River Steel Manufacturing & Mining Co. is running its rolling mill in Lynchburg, Va., and has begun to build a blast furnace.

Bardalaben & Edwards are building a new blast furnace at Woodstock, Ala., which will use coke for fuel.

In Warren County, N. J., the Andover Iron Co. has its three stacks at Phillipsburg all in blast. The Oxford Iron Co. is running one stack on forge iron and one on spiegel. Pequest Furnace is running, and Joseph Wharton has lately put his furnace at Hackettstown in blast.

In Passaic County, N. J., Ringwood Furnace is in blast, making charcoal iron. In Bergen County, Secaucus Furnace, built six years ago, but only recently put in blast, is making Bessemer pig.

In Morris County, N. J., Boonton Furnace, Chester Furnace and both stacks at Port Oram are in blast and doing well.

In Sussex County, N. J., Franklin Furnace (one of the largest in the country) is making nearly 500 tons a week, and both stacks at Stanhope Furnace are in blast.

The Cuyahoga Works, at Cleveland, O., have just finished a large-sized steam helve-hammer for the Otis Steel & Iron Co., being the third made for that company.

Bridge Notes.

The Missouri Valley Bridge & Iron Works, at Leavenworth, Kan., are building a bridge over the Kansas River near Kansas City, with six spans of 160 feet each.

A. D. Briggs & Co., of Springfield, Mass., have just finished a Howe-truss bridge 210 feet long over the Naugatuck River for the New Haven & Derby road, and are building a smaller bridge for the same road.

The Cleveland (O.) Bridge & Car Works have several contracts for bridges on hand, and are very busy. A large new machine shop is being added to the works, which will be used chiefly for bridge work.

The Corrugated Metal Co., of East Berlin, Conn., has taken a contract to build in Manchester, N. H., highway bridges of 51½ ft. span and of 53½ ft. span across canals, and one of 413 ft. in three equal spans across the Merrimack River. The bridges are to be of the Douglas patent parabolic arch truss pattern, and will cost \$57,000, including the piers and abutments.

The King Iron Bridge & Manufacturing Co., at Cleveland, O., have over 200 men employed, and are filling contracts for a number of bridges.

Prices of Rails.

Steel rails are quoted at \$75 per ton at mill, with sales of about 15,000 tons. Foreign rails have been sold as low as \$70 per ton at tide.

For iron rails there is an active demand, but few transactions are reported, buyers being inclined to bargain and hold off for lower prices. Prices are somewhat irregular, \$56 per ton at mill being about the quotation for heavy rails.

Old iron rails are nominal at \$34 to \$35 per ton, with light demand and a weak market.

Railroad spikes are lower, and Pittsburgh quotations are 4 cents per pound.

Blast Furnaces of the United States.

The quarterly statement of the *Iron Age* gives the condition of the blast furnaces of the United States on April 1 as follows:

	In blast.	Out of blast.	Not reported.	Total.
Charcoal.....	102	154	4	260
Bituminous or coke..	140	66	—	206
Anthracite.....	189	40	1	230
Total.....	431	260	5	696

The total weekly productive capacity of the furnaces in blast is 88,410 tons; of those out of blast, 32,589 tons, indicating that it is chiefly the older and smaller furnaces that are out of blast, the average weekly capacity of the 431 active furnaces being 205 tons, and of the 260 idle furnaces, 125 tons.

British Rail Exports.

Exports to the United States and to all countries for the month of March and the three months ending with March have been as follows, in tons:

Steel Rails:	March.	Three months.
To United States.....	4,010	372
To all countries.....	26,553	23,331
Iron Rails:		
To United States.....	10,518	3,382
To all countries.....	12,812	32,796
Total:		
To all countries.....	39,365	109,751

In the total the increase is nearly 50 per cent. for March and 74 per cent. for the three months. The exports to other countries than the United States were a little less in March this year than last.

The New Pullman Car Shops in Chicago.

A notable addition to Chicago's mercantile industry is to be the extensive car works of the Pullman Palace Car Co., ground for which is to be broken to-day. A larger establishment for manufacturing purposes will not exist in the West, and while it will contain all the latest and most improved mechanical appliances in use, it will embody in its architecture a grace and beauty that is quite characteristic of the palace car. The works are to cost \$1,000,000; about 2,000 men are to be employed in them, and the extended arrangement of machinery is to be moved by the Corliss engine, one of the Centennial wonders, which has been purchased by the Pullmans.

After much vain speculation as to the location of the works by outside parties, principally real estate speculators, the Pullman Palace Car Co. laid bare its plans to public scrutiny on Saturday. The works will be located on the Illinois Central Railroad, three-fourths of a mile south of Kensington Station, and between the railroad and Lake Calumet, being bounded by One Hundred and Eleventh street on the south, Lake Calumet on the east, One Hundred and Sixth street on the north, and the Illinois Central on the west. About 150 acres are to be included in the site, and is to be beautifully laid out with walks, drives, lawns, and two attractive parks. The entire area, half a mile deep by a mile long, will be treated with shrubbery and will be inclosed with a wall. A drive, also, of two miles in length will encircle the works. The main entrance will be through an arched gateway from One Hundred and Eleventh street, opening into a large circular park. A park of 300 ft. in width will divide the long stretch of shop-buildings from the railroad.

On one side is water transportation by Lake Calumet and on the other the Illinois Central Railroad tracks, while but a short distance away is the junction of the innumerable roads leading into Chicago.

The structures will be of brick and stone, having 1,130 feet of frontage and facing the double track of the Illinois Central Railroad. They will consist, first, of two parallel buildings for erecting shops, 690 ft. long and 87 ft. wide. The central section, containing the offices and store-rooms, will be 100½ ft. long and 100 ft. deep, three stories high, with a tower rising to the height of 146 ft. In the rear of these will be a series of four buildings, covering an aggregate frontage of 1,047 ft., with a general depth of 200 ft., forming the wood machine shops, blacksmith shop, varnish room, repair shops, and two erecting shops. Still back of these will be another erecting shop, 474 x 86 ft., a dry-kiln 150 x 80, and a foundry 130 ft. front and 200 ft. deep. These buildings are compactly located as regards each other, making them convenient of access. The erecting shops will have stalls for fifty passenger cars and 100 freight cars at one time. Tracks running between the various shops will be provided with numerous turn-tables, so that the cars can be run in and out without switches.

The Corliss engine is to be so situated that its 35 ft. fly-wheel will be in full view from the railroad, and the front of the building it occupies will be ornamented with a large ornamental window. The monster engine cost originally \$114,000, and to bring it on here from Providence, R. I., where it now is, will require a train of thirty cars. Its normal capacity is 1,400 horse-power, but it can be run to 2,500 horse-power.

The engine will arrive at the new works, and be in operation Sept. 1. The greater part of the machinery for the works will be new, and will cost, exclusive of \$125,000, for the engine and boiler, \$300,000. All the building will be lighted with an electric light and heated by steam. There

will be 7,827,026 cubic feet to be warmed, which will require 230,536 feet of steam-pipe.

In connection with the Pullman Palace Car Co.'s works, and just north of them on the same grounds, is to be erected a manufactory of the Allen Car Wheel Co., which is a consolidated corporation of all the paper car-wheel interests in the country. The capital stock is \$1,000,000, and nearly two-fifths is owned by Chicago capitalists. The capacity of the works will be 20,000 car-wheels annually. The buildings were planned by Mr. R. V. Allen, General Superintendent and inventor of the wheel, and are two in number. One will have a frontage of 364 ft., a breadth of 150 ft., and will be two stories high. The second building will be 100 ft. front by 150 deep. The buildings will be graced with a tower. About 100 men will be employed, and the power for running the works will be furnished by means of a shaft connecting with the Corliss engine. The cost will be about \$200,000.

To provide for the laborers to be employed in the two establishments, the Pullman plans include the erection of cottage dwelling-houses, two stories high. Mr. S. S. Beman, a New York architect who drew the plans for the works, has in connection with them drawn plans for the dwellings. They will be located north of the works, and will be of brick, with slate roofs.—*Chicago Inter-Ocean*, April 26.

Examinations for Color-Blindness.

The examiners who have been testing the eye-sight of the employees of the New York Division of the Pennsylvania Railroad, examined in all 780 conductors, engineers, firemen, baggage-masters, brakemen, and switchmen of that road, 58 belonging to the New Jersey Midland and 41 on the Lehigh Valley, 879 men altogether. Of these, only 35, or about 4 per cent., were found to be deficient in color-sense or at all affected by color-blindness, a smaller proportion than was expected.

The Reading Fast Engine.

All sorts of descriptions of the fast engine just built by the Baldwin Locomotive Works for the Philadelphia & Reading road have been going the rounds of the papers. A subscriber sends the following as a sample, embodying some curious statements:

"What is believed to be the fastest locomotive in the country is shortly to be placed on the Bound Brook line between Philadelphia and New York. It is expected to be able to make the distance at a uniform speed of a mile a minute. The engine differs from all others in one material point. Instead of there being two sets of driving wheels there is but one pair, and these are 16½ feet in diameter, which is from 1 to 1½ feet larger than those of the fastest passenger locomotives of the day. The object sought to be obtained by dispensing with the double pair of drivers and the use of but one, is to do away with the connecting rod that rests upon both wheels on each side. In the running of fast trains the vibration has been so great that it frequently happens this rod snaps, demolishes the cabin, and frequently throws the train from the track. On the new locomotive there is no fear of anything of this sort, because the only rod is that which extends from the cylinder box to the one pair of wheels. The weight of the engine is about 84,000 pounds, and the water-tank has a capacity of over 4,000 gallons."

Another paper says that the engine has one driving wheel, 6½ feet in circumference, which would make a curious sort of engine.

Quick Work in a Repair Shop.

Our Chicago, Burlington & Quincy mechanics, though among the very best and most skillful in the world, are by no means given to bragging; yet as a specimen of rapid work it is worthy of mention that the fine new standard engine No. 34 was built in the Aurora shop in just nine days—about as quick as the work would have been accomplished in the large manufacturing establishments where speed is the especial desideratum. The boiler of this engine reached the machine shop on Monday morning of last week, and on Wednesday afternoon of this week the engine, fully completed, was sent to the paint shop. She has been handsomely painted, the varnish is dry, and this afternoon she will be ready for the road, in less than twelve working days from the time her boiler was wheeled into the machine shop.—*Aurora (Ill.) Beacon*.

The Mexican Railroad.

At the regular meeting of the Engineers' Club of Philadelphia, April 17, Mr. Coleman Sellers, Jr., read a paper on the history of the construction of the Mexico & Vera Cruz Railroad, illustrating his remarks with numerous photographs and maps obtained during a recent trip to the country of the Montezumas. As early as 1837 the project was broached, and from that time until it was finally opened, in 1873, by President Lerdo, the road suffered an alternation of success and defeat. During its progress forty different presidents and one Emperor governed our unfortunate neighbor, and each government had in turn to be won over to the plans of the friends of this enterprise, and that in spite of a powerful opposition from various classes of the community. Not only were these difficulties surmounted, but those offered by the climate and the natural obstacles of the route were likewise overcome. At length, after years of labor and the expenditure of millions of money, the road is now an established success, and is to-day one of the grandest specimens of engineering the world can show. The road is 260 miles long, is laid with steel rails, is thoroughly equipped with engines and rolling stock, has fine iron bridges, substantial stone stations, and all tunnels, masonry, &c., are of the best character. The grades and curves are numerous and excessive. The highest point of the road is 8,200 ft. above the sea. It ascends 6,500 ft. in 60 miles and in one case climbs 2,000 ft. in 15 miles. The City of Mexico itself is 7,600 ft. above the sea, or nearly one and a half times as high as Mount Washington. The road was built principally by English capital, but is granted a concession by the Mexican government, which, however, is now much in arrears. All the foreign commerce of the most thickly-settled parts of the Republic passes over the road, and the proper development of the country under a stable government would enable the road to do an enormous business. The state of the country is shown by the fact that each train carries a guard of 30 soldiers of the Mexican regular army.

Steam Street Cars.

An Iowa exchange says that a street road has been opened from Marion, Ia., to Cedar Rapids, about five miles, which is to be worked by separate steam motors. It does not state by whom the motors are built.

Stealing a Ride—A Four-Footed Tramp.

The Plainfield (N. J.) *Bulletin* says that a passenger on a New Jersey Central train turned a cat loose out of a bag at Bergen Point. The cat at once made for one of the trucks under a passenger car and there she stuck while the train ran to Jersey City, then from Jersey City over the Long Branch Division to Sea Girt, back to Jersey City again, and finally out to Dunellen again, about 145 miles in all. She utterly refused to leave the truck until the train was housed for the night at Dunellen, when she finally yielded to the persuasions

of the conductor, and consented to go home with him. She is now comfortably housed, and doubtless boasts of her travels in the back yard at night, as cats will.

Force of Wind on the Prairie.

The extra freight train which left here at 1:40 Wednesday afternoon over the Chicago & Iowa Road, though a comparatively light one, was stalled at Sugar Grove by the wind. So strong was the gale that it completely stripped off the canvas roof from the way car, and while upon the ridge Conductor Covers rather expected to have his entire train blown from the track.—*Aurora (Ill.) Beacon*.

OLD AND NEW ROADS.

Atlantic & Pacific.—The arrangements made for the issue of bonds by this company are more fully shown in the following extracts from the circular issued to its stockholders by the Atchison, Topeka & Santa Fe Company:

"The railroads of the Atchison, Topeka & Santa Fe Railroad Company, and of the St. Louis & San Francisco Railroad Company, connect in the state of Kansas; and these companies have agreed with the Atlantic & Pacific Railroad Company to build immediately the line of railroad and telegraph above described, to be known as the Western Division of the Atlantic & Pacific Railroad, and to operate it in connection with their own roads, as a continuous through line from the Mississippi and Missouri rivers to the Pacific Ocean."

"The Atlantic & Pacific Railroad Company will issue, upon said Western Division, its first-mortgage bonds at the rate of \$25,000 per mile, and its income bonds at the rate of \$18,750 per mile. And for the purpose of providing means for the immediate construction and equipment of its said line of road westward from the Rio Grande to the Colorado River, a distance of about 600 miles, it will take a cash subscription of \$10,000,000 from the stockholders of the Atchison, Topeka & Santa Fe Railroad Company and the St. Louis & San Francisco Railroad Company—\$5,000,000 from each company.

"The first mortgage 6 per cent. gold sinking-fund bonds above referred to will be issued in coupon and registered form, secured by a first lien upon the railroad, lands, land-grants and other property of the said Western Division, payable July 1, 1910, and may be canceled whenever the bonds can be purchased at not exceeding 110 per cent. and interest. The Atchison, Topeka & Santa Fe Railroad Company and the St. Louis & San Francisco Railroad Company have severally guaranteed the payment of the interest on said bonds to the extent of 25 per cent. of their respective gross earnings upon all business received from and delivered to said Western Division, during the six months ending on the first days of the preceding October and April respectively, and each bond will bear a certificate to that effect.

"The distance from Kansas City to Albuquerque by the Atchison, Topeka & Santa Fe road is 918 miles, and from St. Louis by the St. Louis & San Francisco road to a junction with the main line of the Atchison, Topeka & Santa Fe road is 547 miles, aggregating 1,465 miles, which will be contributory to said guarantee.

"To secure such interest advances and the completion of the Western Division, should the proceeds of the first-mortgage and income bonds prove insufficient therefor, but for no other purposes, a second mortgage may be issued upon said Western Division at the rate of \$10,000 a mile, secured by a second lien upon the road, land grant and other property of said Western Division.

"The income bonds above referred to will be issued in coupon and registered form, secured by a mortgage on the net earnings of the Western Division, as therein described, payable Oct. 1, 1910, with semi-annual interest to the extent of such net earnings, but not exceeding 6 per cent. per annum, and non-cumulative.

"For \$4,000 in cash, payable 10 per cent. within ten days after allotment, and not exceeding 10 per cent. in any one month thereafter, the Atlantic & Pacific Railroad Company will deliver to the subscriber \$4,000 of its first-mortgage bonds and \$3,000 of its income bonds.

"Interest will be allowed upon all such payments at the rate of 6 per cent. per annum, payable semi-annually, the first payment of interest to be made Jan. 1, 1881, with adjustment of interest on the first-mortgage bonds upon full payment of the subscription and delivery of the securities.

"All subscriptions must be made in blocks of four thousand dollars or multiples thereof, and on condition that they may be canceled any time before 40 per cent. shall have been called, in whole or in part, but not less than 20 per cent. at any one time; and in such case the subscribers shall be repaid the money paid by them, with interest at 6 per cent., and shall receive income bonds at the rate of \$500 for each \$1,000 of subscription canceled.

"Failure to pay any installment when due will render the subscription, and any installments already paid, subject to forfeiture at the discretion of the board of directors."

Baltimore & Delta.—At a recent meeting of the board it was resolved to push work on the grading of this road. It was also decided to take legal steps to compel the payment of delinquent subscriptions.

Boston & Albany.—This company will put on its road on May 5 a workingman's train to run morning and evening at a uniform low rate of fare, like the train run on the Eastern road between Lynn and Boston. The new train will run between Boston and Newton Lower Falls, 12 miles.

From June 1 the passenger tariff on this road will be at the uniform rate of 2½ cents per mile. The present rates is 2.83 cents per mile for all distances under 20 miles, and 3 cents per mile for all over 20 miles. No change will be made in the prices of season and package tickets.

Burlington & Missouri River in Nebraska.—This company is building, at Plattsmouth, Neb., a brick car-shop in the form of a round-house, consisting of ten stalls 60 feet deep. It is now using ten stalls of the engine-house which are needed for the increasing equipment required by the rapidly growing traffic of the road. The company is also building a brick blacksmith shop, 65 x 200 ft. At Lincoln, Neb., there will be built a brick round-house of 20 stalls, and a large brick passenger depot to contain the offices of the Superintendent, Train-Master and other division officers. The depot will cost about \$40,000.

Canadian Pacific.—Ten tenders will be received by F. Braun, Secretary of the Department of Railroads and Canals, of the Dominion of Canada, at his office in Ottawa, until May 15, for furnishing and erecting the water stations on this road. All the tanks must be water-proof, and the pumping machinery may be applied to use either steam or wind, according to locality. Drawings and specifications may be seen at the office in Ottawa.

Cape Fear & Yadkin Valley.—At the recent annual meeting in Fayetteville, N. C., the stockholders voted to approve and ratify the agreement of consolidation with the Mt. Airy & Ore Knob Railroad Company; also to approve the location of the extension of the road on what is known as the Walnut Cove route.

Chicago & Grand Trunk.—Regular passenger trains began to run over this road between Chicago and Port

Huron, April 26. Freight trains have been running for some time. The trains arrive at and depart from the temporary station of the Chicago & Western Indiana road at Archer and Stewart avenues in Chicago, some two miles south of the Lake Shore's depot.

Chicago & Northwestern.—Work on the Dakota Extension of this road (the Dakota Central) is being pushed. Tracklaying has been begun at Volga, last year's terminus, and the road is all under contract to the Missouri River at Ft. George Island, 130 miles from Volga.

Chicago & Pacific.—In Chicago, April 21, the United States Circuit Court directed Receiver Whitman to transfer the road to the company, the redemption money having been paid in full. The Receiver will retain all money in his possession, and collect all earnings up to April 25, and will settle all claims arising from his operation of the road up to that date. He is ordered to report to the Court by June 1 and to make then a full statement showing all receipts and disbursements and all claims which may then be outstanding.

The following circular announcing the transfer of the road has been issued:

"Notice is hereby given that on and after Sunday, April 25, the Chicago & Pacific Railroad will be operated by the Chicago, Milwaukee & St. Paul Railway Company.

"All freight destined to points located upon or reached by the Chicago & Pacific should be delivered at the regular freight depots of the Chicago, Milwaukee & St. Paul Railway Company, in Chicago, commencing Monday morning, April 26."

Chicago & Tomah.—This road has been sold to the Chicago & Northwestern Company. It is a narrow-gauge road, extending from Woodman, Wis., on the Chicago, Milwaukee & St. Paul's Prairie du Chien Division, southward to Lancaster, 31 miles, with a branch from Dankloff Junction to Montpont, 14 miles. An extension about eight miles, which is all graded, will carry this branch to McCormac, the terminus of the Galena & Wisconsin, which also has been bought by the Northwestern. These two together make a line nearly 80 miles long from Galena nearly due north to the Prairie du Chien line of the Chicago, Milwaukee & St. Paul. The Northwestern has no road nearer to it than Freeport—50 miles east of Galena.

Chicago & Western Indiana.—In accordance with the decision of the Appellate Court declaring void the ordinance allowing this company to build its road on the route adopted in Chicago, the Circuit Court has enjoined the company from proceeding further in condemnation of land required for the road. The company will probably appeal, but the injunction will hold, unless the City Council passes a new ordinance free from legal objections, or the Supreme Court reverses the decision of the Appellate Court.

The Chicago City Council on April 26, after much discussion, passed an amended ordinance giving this company the right to extend its line in the city limits. The new ordinance is believed to be free from the defects which caused the Court to pronounce the former one invalid. This will probably enable the company to complete its road before long, which is very important to the Wabash, which has no other inlet into Chicago, and to the Grand Trunk, which will run its passenger trains over it.

Chicago, Burlington & Quincy.—Mr. C. E. Perkins, the Vice-President and General Manager, has stated that this company has given up all intention of extending the Burlington & Missouri River in Nebraska to Denver this season. It is extending its line up the Republican valley to Indianola, and there, about 250 miles east of Denver, the terminus will be for the present.

Chicago, Milwaukee & St. Paul.—This company assumed control of the Chicago & Pacific road on April 25, adding the 88 miles of that road to its system. Arrangements are to be made at once for the extension from Byron, Ill., west to Lanark, about 80 miles.

The company has negotiated with Kuhn, Loeb & Co., of New York, for the sale of the \$3,000,000 bonds to be issued upon this (the Chicago & Pacific) division. The proceeds are to be used to refund the money advanced to redeem the road, and to pay for the new extension.

The Southern Minnesota and its leased Central road will be transferred to this company on May 1, and will be thereafter known as the Southern Minnesota Division. This will add to the company's lines 350 miles of road. The Southern main line from North La Crosse to Flandreau, Dak., 310 miles, and the Central Branch from Wells to Mankato, Minn., 40 miles.

The *Commercial and Financial Chronicle* says: "It is stated that the Chicago, Milwaukee & St. Paul Company will issue about \$9,000,000 new 6 per cent. bonds on the Southern Minnesota. These bonds are to be known as the Chicago, St. Paul & Milwaukee (Southern Minnesota Division) bonds, and for exchange the new bonds are to be issued at the rate of about \$125 to \$137 of the old. The bonds under this mortgage are to be applied as follows, viz:

"Nos. 1 to 6,124 to retire the following old liens:	
Southern Minnesota Railroad 'Pink' bonds, 7 per cent.	\$225,000
Do. construction bonds and old accrued interest	\$4,474,376
Less concession to C. M. & St. P. Ry.	309,376
	4,165,000
Extension bonds, 7 per cent., redeemable at par.	1,290,000
Central Railroad 1st mortgage 7 per cent. bonds, \$600,000, redeemable at 78 per cent. of par value.	468,000
Total	\$6,124,000

"Nos. 6,125 to 5,586 to complete the railway from Flandreau to Sioux Falls.

"Nos. 5,587 to 7,000 to the purchase of equipment for, and making permanent improvements on, the Southern Minnesota Division.

"Nos. 7,001 to 9,000 to the construction and equipment of an extension of the branch from Mankato to Minneapolis and St. Cloud, but only to the amount of its actual cost, and not exceeding \$15,000 per mile, in sections of 10 miles each of completed road."

Chicago-Omaha Fast Trains.—The Chicago *Inter-Ocean* of April 23 says: "The Iowa pool lines are now engaged in preparing the new time-tables that will go into effect Sunday. As the changes are numerous, the General Passenger agents are very busily engaged just now. The Chicago & Northwestern road will probably not have its time-table ready until to-morrow.

"The following is the time at which the trains of the Chicago, Rock Island & Pacific road, which will leave here at 12:30 p. m., will reach the principal points on the Illinois Division, with the time made by the old 10:30 a. m. train: Chicago, 12:30 p. m. and 10:30 a. m.; Blue Island, 1:17 p. m. and 11:27 a. m.; Joliet, 2:05 and 12:25 p. m.; Morris, 2:45 and 1:20; Ottawa, 3:27 and 2:10; LaSalle, 3:54 and 2:30; Bureau Junction, 4:25 and 3:15; Chicago, Burlington & Quincy Crossing, 5 and 4:03; Geneseo, 5:55 and 5:18; Moline, 6:35 and 6:10; Rock Island, 6:40 and 6:20.

"The Chicago, Burlington & Quincy road will withdraw the train that left here at 6:30 a. m. and arrived at Council Bluffs at 9:10 a. m. The Nebraska, Kansas and Dubuque express, which left here formerly at 10:30 a. m., will, after

Sunday, start at 10 a. m. The Pacific and Kansas express will leave here at 12:30 p. m., arriving at Galesburg at 6 p. m.; Quincy, 10:05; Hannibal, 11:10; Burlington, 8:10; St. Joseph, 8:25 a. m.; Atchison, 9:40; Kansas City, 8:30; Lincoln, Neb., 12:15 p. m., and Council Bluffs at 9:20 a. m. These changes will all go into effect Sunday.

"It is learned that the Union Pacific road is becoming interested in the reduction of time made by its trains, which leave Omaha at 11:55 a. m. and arrive from the West at 3:45 p. m. As this road has no competition, it did not feel called upon to increase its rate of speed, which is very slow, averaging between 16 and 20 miles per hour. Travelers have long protested against the slow time made, and now the report is current that arrangements are being made to decrease the time between Ogden, Utah, and Omaha, in order to make earlier Eastern connections here."

Cincinnati, Hamilton & Dayton.—A dispatch from Cincinnati, April 32, says: "An understanding has been effected finally with regard to the future management of the Cincinnati, Hamilton & Dayton Railroad, in connection with the Cleveland, Columbus, Cincinnati & Indianapolis, which seems to be satisfactory to all parties. It is, that at the coming election of Cincinnati, Hamilton & Dayton directors the Cleveland, Columbus, Cincinnati & Indianapolis Company shall name three and the Cincinnati, Hamilton & Dayton nine. The President shall be of the Cincinnati, Hamilton & Dayton party, while the Cleveland, Columbus, Cincinnati & Indianapolis Company will have a minority of the board and of the stock. They will be joined by some heavy stockholders of the Cincinnati, Hamilton & Dayton, and thus have control. One saving of \$90,000 a year will be made by surrendering the lease of the Cincinnati & Baltimore track and of the Cincinnati, Indianapolis, St. Louis & Chicago track and running the trains of the Dayton Short Line in on the Cincinnati, Hamilton & Dayton track from Ludlow Grove."

Cincinnati Southern.—The Trustees have finally decided to build five miles of road from Boyce's station to Chattanooga, where the Western & Atlantic track is now used. The estimated cost is \$75,000. The line was all surveyed and located some time ago, and is all ready for the contractors. The Engineer has been directed to advertise for bids for the construction of this section.

Cleveland, Tuscarawas Valley & Wheeling.—The first regular train on this road ran through to Bridgeport, on the Ohio River, opposite Wheeling, W. Va., on April 19. A mixed train will be run between Uhrichsville and Bridgeport for a week or two, when the regular passenger trains will begin to run from Black River and Cleveland to Bridgeport. The extension from Uhrichsville southeast to Bridgeport is 57 miles, making the road 158 miles from Black River on Lake Erie to its Ohio River terminus. The extension passes through the hilly country of Southern Ohio, and required some heavy work, including several tunnels. It is expected to furnish an outlet for the coal and iron ore of the Tuscarawas Valley to the Ohio River and to the iron works of Wheeling and the neighborhood. There is also, we believe, some coal territory on the new line. It runs diagonally across the country between the Pittsburgh, Cincinnati & St. Louis and the Baltimore & Ohio, much of the road being a considerable distance from any other line. The road is now now complete except a short spur from Bridgeport to West Wheeling, where transfer slips are to be built, so that cars can be run down upon barges and ferried across the Ohio to Wheeling. The stations on the extension are as follows: Bridgeport, Pasco, Barton, Henderson, Fairpoint, Bruce, Lafferty, Flushing, Holloway, Cleveland, Butler, Freeport, Tippecanoe, Stillwater, Newport and Uhrichsville.

Columbus, Chicago & Indiana Central.—The Trustees and Receivers give notice that they will pay on presentation at the office of A. Iselin & Co., No. 45 Wall street, New York, coupons due Nov. 1, 1879, on Columbus & Indianapolis Central second-mortgage bonds, and coupons due Feb. 1, 1880, on Toledo, Logansport & Burlington 7 per cent. first-mortgage and 6 per cent. income bonds.

Connecticut Western.—On April 27 the State Treasurer of Connecticut took formal possession of this road as trustee under the mortgage, and will hold and work it for account of the bondholders. This action was taken, as the law requires, on the written request of holders of over one-third of the bonds, the exact amount represented in the petition being \$1,289,000. This action has been opposed by some of those bondholders who agreed to take preferred stock for their claims, but it is now probable that a foreclosure will be pressed, in spite of this opposition.

Denver & Rio Grande.—A large force is now at work on the line from Canon City to Leadville, and the grading is advancing very fast. Ties are being put down and track-laying was begun last week.

Franklin & Pittsylvania.—This road was completed last week, and regular trains are to be put on very soon. It extends from Rocky Mount, the court-house of Franklin County, Va., eastward to Pittsville, 33 miles. At Pittsville it connects with the Pittsylvania road from that place east eight miles to the Virginia Midland at Ward's Springs, 28 miles north of Danville. The whole line from Ward's Springs to Rocky Mount, 41 miles, will be worked as a branch of the Virginia Midland. It penetrates a section heretofore without a railroad and passes by some deposits of valuable iron ore, now worked at Pittsville and soon to be opened at other places. It is a narrow-gauge road.

Georgia Railroad Commission.—The following additional modifications of the Commission's tariffs are made by a circular dated April 5:

"1. The Macon & Brunswick Railroad Company may make its maximum rates for freights by adding 20 per centum to the standard rates of freights established by the Commissioners.

"2. The Louisville & Wadley Railroad Company is allowed to continue as its maximum passenger rates those charged by it at present.

"3. Lumber, laths, shingles and staves will be classed, when in car loads, at Class O in place of P. Tan-bark in car loads will be Class O."

And the following by another circular dated April 18:

"1. The maximum rate for freights for the Savannah, Florida & Western Railroad is hereby fixed at 20 per centum above the standard freight tariff.

"2. For the Central Railroad & Banking Company at 20 per centum above the standard freight tariff, except on cotton, which remains at standard rates.

"3. For the Upson County Railroad at 50 per centum above standard freight tariff, for freights; and for passenger tariff rates one cent per mile can be added to its full rates and one-half cent to half rates.

"4. Inasmuch as the Georgia Railroad & Banking Company entertain doubts as to their right, under the provisions of their charter, to charge the standard freight rates prescribed by the Commission for short distances, it is ordered that Rule 6 be so relaxed in its operation as not to require that company to reduce, along the entire line, by reason of reduction on such short distances.

"5. The following changes have been adopted in the

standard freight tariff, viz.: The columns of rates for Class J—Cotton, and Class K—Fertilizers, shall be as follows:

Distances.....	50	100	150	200	250	300	350
J—Cents.....	20	30	35	37	40	42	45
K—Cents.....	8	10	11	13	15	16	17

"6. The following addition is made to 'Rules for Sleeping Car Berths': Provided, however, that for a lower berth, with upper berth not lowered, the fare may be not exceeding \$1, for 150 miles or less, and for distances between 150 and 200 miles not exceeding \$2."

Grand Rapids & Indiana.—It is reported that the extension from Petoskey, Mich., to the Straits of Mackinac will be built this season. Arrangements are being made to begin work.

Jerome Park.—This company has been organized to build a short branch line from the New York & Harlem road to Jerome Park, the famous race-track, which is about a mile from the railroad.

Kansas City, St. Joseph & Council Bluffs.—It has been reported for some time that the Gould interest was trying to secure control of this company. It is now said that their efforts have been defeated, and that a majority—nearly two-thirds—of the stock has been secured by Boston parties who are largely interested in the Chicago, Burlington & Quincy, and who will hold it to control the road in the interest of that company.

The Boston *Transcript* says that terms of sale to the Chicago, Burlington & Quincy having been agreed upon, that company will pay cash or its own stock at \$124 per share, at its own option, for the income bonds and stock of the Council Bluffs road, paying \$72.50 per share for the stock and 90 per cent. for the income bonds.

Lake Erie & Western.—The people of Sandusky, O., have voted to subscribe \$60,000 in aid of the proposed extension of this road from Fremont to Sandusky. The work will be begun very soon.

Little River Valley & Arkansas.—This company is making arrangements to extend its road from Malden, Mo., southwest 18 miles to the St. Francis River. The extension will enter a country very rich in lumber and now without any facilities for transportation. The road is of 3 feet gauge, and now runs from Malden east by north to New Madrid on the Mississippi, a distance of 27 miles.

Lookout Mountain.—At a meeting held in Chattanooga, Tenn., last week, the Rome & Summerville and the Memphis Branch companies were consolidated with this company. By this action all the companies projecting parts of the proposed line from Chattanooga to Rome, Ga., are brought into one corporation, and the company further secures \$170,000 in stock subscriptions, 24 miles of graded road-bed, and a bridge over the Oostanaula River. The contract for the road has been let to R. G. Huston & Co., who have just finished the Cincinnati Southern.

Louisville & Nashville.—The United States Circuit Court has granted a temporary injunction to prevent this company from refusing to carry the freight and messengers of the Southern Express Company over its Mobile & Montgomery line. The company had notified the Southern Express officers, that they must discontinue their shipments over the line, an exclusive contract having been made with the Union Express Company.

Massachusetts Legislature and Railroads.—The Boston *Advertiser* says of the session of the Massachusetts Legislature just finished:

"Railroad topics have been as prominent this year as usual. The Boston & Albany road asked for leave to buy the Springfield & Northeastern road, and a bill was finally passed in the form of authorizing the latter road to sell its property and franchise to the Boston & Albany road. This was not a case of outright transfer of the property at once, but the latter road held a mortgage on the former, and really obtained possession of it as the conclusion of previous transactions. From the Nashua & Lowell road came a petition which resulted in a stubborn fight in the Senate, after long and frequent hearings before the Railroad Committee. It asked for leave to use the cut of the Boston & Lowell road through the ledge at Lowell. If the leave were granted, the former road could connect with the Boston & Maine road at little expense and get a line to Boston independent of the Boston & Lowell. Finally, the bill in favor of the Nashua road was rejected by a very slight majority, and the Boston & Lowell road remained master of the cut. Leave was given to the New London Northern Railroad to issue bonds to the amount of a million and a half of dollars. A petition from the road was presented from which the favorable report was made. By the act the road is authorized to retire its present bonded debt, pay its floating debt and to extend its road. No extension is to be built, but the road will buy that part of the Vermont & Massachusetts road extending from Miller's Falls to Brattleboro. A favor was granted to the New York & New England Railroad, authorizing it to hold shares to the amount of \$500,000 in any incorporated steamboat companies running steamboats or barges in connection with its own line, provided that a majority of the stock shall vote to take such shares. The bill refers to transfer steamers running from Harlem to Jersey City in New York harbor, the Maryland being the boat in use at present. As to the petition of the New York & New England road to acquire additional terminal facilities on the South Boston flats, the whole subject is too fresh in the public mind to make it necessary to recall it. The Massachusetts Central Railroad was given permission to cross the Lexington & Arlington railroad at grade, and to make such changes in its location as will enable it to use part of the tracks of the Ware River road and the New London Northern road, and allow it to take a short cut to the Hoosac Tunnel line. The charter of the Lee & Hudson Railroad in Berkshire county has been revived without any opposition. Return of prosperity made it probable to the friends of the road that it would be a paying investment; the town of Lee wanted connection with the Housatonic road, and so the breath of life was put into it again. Another railroad which came to the Legislature for a law and obtained it was the New Haven & Northampton road. It secured authority to extend its line from Northampton, through Hatfield, Whately, Deerfield and Conway, so as to connect with the Troy & Greenfield Railroad at Bardwell's Ferry, and also from a point in South Deerfield, through Deerfield and Montague, to Turner's Falls. A measure which awakened much public interest, but which found no defenders upon the floor of either chamber, was the petition of William Aspinwall and others for the union of the Boston & Albany with the Boston & Providence Railroad. The hearings before the Railroad Committee were fully attended, but the many protests which were entered by the residents along the line of the Providence road, joined with the railroad opposition, stopped in the committee-room the movement for the union, and the petitioner was given leave to withdraw. The contract of the Boston & Albany road with the New York Central was brought to the attention of the Legislature, and a little flutter was created for a time, but finally no action was taken, except the passage of a resolution that the state directors of the Albany road be instructed to use their influence to prevent the consummation of the contract. Authority to consolidate was given to the Boston & Maine and the Eastern

railroads. The petitioners for the incorporation of an underground railroad were given leave to withdraw. In regard to the South Boston flats a bill was passed giving any railroad company permission to enter upon the flats for the purpose of connecting the flats with any then existing railroads, under regulations to be prescribed by the Harbor and Land Commissioners. General railroad laws were passed to punish the throwing of missiles at railroad cars or passengers; to prevent the entry upon or taking of land for the construction of any railroad till the county commissioners have determined the question of grade crossings; and to prevent unfair discrimination by railroads in the transportation of grain. An order contemplating legislation against color-blindness was void of any positive result, and a bill for a tribunal to decide upon the exigency of railroads before a location is granted was defeated.

Miami Valley.—The purchasers of this unfinished road at the recent foreclosure sale have organized a new company by the same name, and propose beginning work at once, in order to complete the road from Cincinnati to Waynesville, 42 miles.

Mobile & Ohio.—The round-house and repair-shop at Macon, Miss., were blown down on the night of April 25 by a tornado, which did much damage in all the surrounding country. The force of the wind was so great that 25 cars in the yard were blown from the track and most of them upset.

New York & New England.—This company has issued the following circular giving its side of the case in the controversy over the South Boston Flats:

"1. The New York & New England Railroad Company desires to purchase the 25-acre tract of land which it is now occupying under a lease from the commonwealth; also the 12-acre tract which lies between its main line and the 50-acre tract.

"2. It offers as much for the 25-acre tract as has been offered by any other party, under the same terms and conditions.

"3. It is willing that the locomotives and trains of the proposed Junction Railroad, if one shall be built, or of other connecting railroads wishing to use terminal facilities on the flats, shall run over its tracks from the point of junction of such railroad to the flats, provided that all trains while on its tracks shall be subject to its rules and regulations.

"4. It is willing that the charges for the use of its railroad tracks, yard and terminal facilities shall be established from time to time by the Board of Railroad Commissioners.

"5. It claims that conducting a terminal business merely as an incident to its main business, it can afford to do it at less rates than any independent company which must look solely to its income from its terminal business for its dividends.

"6. It claims that being now in the occupancy of the 25-acre tract, using it for the purposes for which it was always intended, having made a large investment thereon in buildings, tracks, pavements and roads, and intending to make still further improvements in the way of warehouses and elevators, it has a right to preference as a purchaser.

"7. It claims that by the use of these grounds and its main line it can give accommodation to other roads requiring terminal facilities in a shorter space of time than can be done by any other possible means.

"8. The state owning one-sixth of the entire property of the New York & New England Railroad Company, and controlling absolutely its management by electing its directors, should, as a matter of pecuniary interest to itself, give the New York & New England Railroad Company the preference as to the purchase of this land over any private corporation, the terms and conditions of sale being equal.

"9. There is no agreement nor evidence before the Legislature which shows that the proposed sale of this land to the Atkins party will bring a single additional mile of railroad, or an additional pound of business to the commonwealth flats. To the contrary, as far as known, this party does not control any railroad terminating upon these flats or having a terminus within 140 miles of them. It will be noted that it has reserved the privilege of assigning its interests under the agreement to purchase this land to another company, and that the Commissioners have already agreed to accept the obligations of this latter company without any restriction whatever, either as to its business, objects or solvency.

"10. The New York & New England Railroad Company refers to the letters of Mr. Cassatt, of the Pennsylvania Railroad, and Mr. Blanchard, of the Erie Railroad (submitted to the Committee), together with the evidence of Mr. Charles Francis Adams, late Railroad Commissioner of this Commonwealth, as being conclusive as to the necessity of these lands to the New York & New England Railroad Company and the proper manner of using them.

"11. The New York & New England Railroad Company controls 450 miles of railroad, or more than any other railroad company in New England except the Old Colony, which controls 461 miles. It has had a larger percentage of increase in its earnings, both gross and net, during the current railroad year, than is reported of any other railroad in New England and it is able to meet any obligation which it will consent to assume in reference to this or any other property.

"12. Is it fair that the state should sell this land now occupied by the New York & New England Railroad Company, and shown by the evidence before the Committee to be absolutely necessary for the proper accommodation of its present business, to a party whose sole object in buying it may be to speculate on it? They seem to have left the door open for this purpose in the last paragraph of the agreement to purchase.

"13. Is it decorous that the Land and Harbor Commissioners should undertake to sell this land, and thereby remove it from the jurisdiction of the Legislature, whose servants they are, when they knew that the Legislature itself had the whole matter under consideration and was about to take final action upon it?"

New York Railroad Law.—On April 28 the New York Assembly passed the law known as the anti-discrimination law (which has frequently been referred to in our columns) by a vote of 81 to 33. Some slight amendments were made.

New York, Ridgeway & Pittsburgh.—This company has been organized as successor to an old corporation known as the Northern Railroad & Navigation Company, which was intended to be the Pennsylvania end of the Rochester, Nunda & Pennsylvania road. The new company purposes building from Tionesta, Pa., on the Allegheny Valley road east to Ridgeway on the Philadelphia & Erie, and thence north to a junction with the Buffalo, New York & Philadelphia, about 60 miles in all. A branch to connect with the Bradford Branch of the Erie is also proposed.

Northern Pacific.—The new track of the Missouri Division is being lined up and leveled, and regular trains will probably be put on about May 1, to run to the Y-switch, 58½ miles from Bismarck. The following stations have been established: River Landing, 2 miles from Bismarck; West Side, Mandan, 5½ miles; Comanche, 14½ miles; Sweet Briar, 21½ miles; Spur, 30 miles; Blue Grass, 35 miles; Bly's Mine, 40½ miles; Curlew, 51½ miles; Y., 58½ miles. A line is being surveyed from near Bismarck to Ft.

Lincoln, where the river channel is better suited for the transfer-boat, and a better landing can be made than at Bismarck.

Pennsylvania.—This company's monthly statement shows for the month of March, as compared with March, 1879, for all lines east of Pittsburgh and Erie:

An increase in gross earnings of (25.9 per cent.).....\$675,118
An increase in expenses of (9.4 per cent.).....151,093

Net increase (29.2 per cent.).....\$524,025

For the three months ending March 31, as compared with the same period in 1879, the same lines show:

An increase in gross earnings of (21.1 per cent.).....\$1,021,782
An increase in expenses of (15.4 per cent.).....601,705

Net increase (53.1 per cent.).....\$929,877

For the three months of this year, all lines west of Pittsburgh and Erie show a surplus over all liabilities of \$979,185, being a gain of \$829,736 over the same period last year.

The company's engineers are now locating a branch from Port Perry, near Pittsburgh, to McKeesport. It will be about four miles long, and will be parallel to the Baltimore & Ohio track.

The grading is nearly finished on the extension of the Pittsburgh, Virginia & Charleston Division from Monongahela City, Pa., to Brownsville, 23 miles. Track laying has been begun at Monongahela City. A second track is to be laid on this division from Pittsburgh to Port Perry Crossing, about 10 miles. This section of the road is used as a connection between the main line and the Pittsburgh, Cincinnati & St. Louis road.

Track is laid on the Southwest Pennsylvania Branch to Fairhance, Pa., two miles south of the old terminus at Oilphant and 44 miles from the main line at Greensburg. There is a blast-furnace at Fairhance, and plenty of coal, ore and limestone in the vicinity.

It is said that the company's engineers are surveying a line to run from a point on the Southwest Pennsylvania Branch across to Latrobe on the main line, passing through or near Mt. Pleasant. The distance is about 20 miles, through a coal region. Part of the line is covered by a branch to Mt. Pleasant, now nearly finished.

Philadelphia & Reading.—This Company's statement for March and the four months of its fiscal year from Dec. 1 to March 31 is as follows:

	March.	1879.	1880.	1879.	1880.
Gross earnings.....	1880.	1879.	1880.	1879.	1880.
Railroad traffic.....	\$1,404,878	\$899,570	\$4,086,213	\$3,426,097	
Canal traffic.....	6,894	75,804	35,503	84,894	
Steam colliers.....	37,979	69,647	227,951	226,497	
Richmond barges.....	7,571	6,061	29,040	20,420	

	1880.	1879.	1880.	1879.
Total R. R. Co. \$1,457,322	\$1,041,142	\$5,270,307	\$3,757,878	
Coal & Iron Co. 927,070	753,179	2,854,477	2,311,271	
Total.....	\$2,384,392	\$1,794,321	\$8,124,784	\$6,069,149

Traffic:
Passengers carried.....715,208
Tons merchandise.....544,393
Tons coal.....537,809
Tons coal on colliers.....40,196
Tons coal mined:
By Coal & Iron Co. 254,703
By tenants.....94,986

	1880.	1879.	1880.	1879.
Total.....	340,779	421,070	1,306,096	1,332,060

The statement shows a great gain in spite of the lesser coal traffic this year. For March the railroad company's gross receipts increased \$416,180, or 40.0 per cent.; the coal and iron company's increased \$174,491, or 23.2 per cent., and those of both companies, \$590,671, or 32.9 per cent.

For the four months the receipts of the railroad company increased \$1,521,425, or 40.5 per cent.; those of the coal and iron company \$543,206, or 23.5 per cent., the united gain being \$2,064,635, or 34.0 per cent. The coal traffic was less, but the selling prices and tolls were much higher than a year ago. It must not be forgotten that the large traffic of the North Penn & Bound Brook Division is included this year, and not last.

Phillipsburg, Farnham & Yamaska.—This partly finished narrow-gauge road has been leased to the Central Vermont Company, and will be changed to standard gauge and opened for business. It extends from Stanbridge, P. Q., north to St. Hyacinthe on the Grand Trunk, about 25 miles. It is generally parallel to the Southern Railway's Northern Division.

Portland & Ogdensburg, Vermont Division.—The St. Albans (Vt.) Messenger says: "Belden & Ide, as attorneys for Asa D. Potter, of Boston, have been buying up the lien claims, upon which a decree was obtained in the Supreme Court against this company, paying therefor 75 cents on the dollar, the purchasers assuming all expenses of litigation. The holders of about one-half of the entire amount of these claims, exclusive of that of the Messrs. Fairbanks, have accepted the offer. The total amount of these claims, exclusive of the Fairbanks interest, is some over \$60,000. At the time these claims were allowed, and the court issued a decree to have the same paid out of the net earnings of the road, or have all the property sold to satisfy the same, it was supposed the claimants would receive their pay in full. But in view of the fact that a sale of the personal property of the road has been decided upon by the new corporation, and that such sale will probably not produce enough to pay a very large percentage upon the claims, and that the creditors must rely upon net earnings for the balance of their pay, and that such net earnings are doubtful and uncertain, the claimants prefer to take the offer of a smaller sum and have no more trouble or doubt about the matter. It is supposed that Mr. Potter is purchasing these claims in the interest of the new corporation—the St. Johnsbury & Lake Champlain Railroad Company—and that this action will facilitate the closing up of the old corporation and the inauguration of the new."

Port Royal & Augusta.—The following statement is made for the six months from Sept. 1 to Feb. 29:

	1879-80.	1877-78.	Increase.	P. C.
Passage.....	\$25,238.35	\$20,092.10	\$5,146.25	25.6
Freight.....	142,281.45	106,905.62	35,375.83	33.1
Other sources.....	20,820.26	12,094.18	8,726.08	60.7

	1880.	1879.	Increase.	P. C.
Total.....	\$188,340.06	\$139,091.90	\$49,248.16	35.4
Earnings per mile.....	1,981.61	1,241.89	739.72	59.6

The road is reported as doing a better freight business this season than ever before.

St. Louis, Kansas & Arizona.—Track is now laid on the branch of this road from Osawatimie, Kan., west by north to Ottawa, 21 miles.

This road, which was started in the interest of the Missouri Pacific and is owned by that company, is worked by it directly, and known as the Kansas & Arizona Division.

Southeastern Colonization, of Manitoba.—The Canadian government has agreed to give this company 2,500 acres of land per mile, on condition that work is begun at once.

Southeastern, of Canada.—Montreal papers state that

although the ice bridge over the St. Lawrence at Montreal was a good thing for this road it resulted in a nominal loss. The cost of the structure was about \$15,000, while the receipts from transportation of cars were only about \$6,000. Of course the company has the necessary material for laying the track next winter, when arrangements will have been made for handling double the quantities of freight handled this winter—1,000 cars.

Southern Arizona.—This company has been organized to build a railroad from Tombstone, Arizona, the centre of the Tombstone mining district, to the Southern Pacific at the crossing of the San Pedro River. A survey is now being made.

Southern Minnesota.—Notice is given that holders of Farmers' Loan & Trust Company certificates for construction bonds can exchange them for Chicago, Milwaukee & St. Paul 6 per cent. bonds at the rate of \$1,250 for each old bond and past-due coupons, on presentation at the Trust Company's office in New York.

Southern Pacific.—Track on the Arizona Division is now laid to Tombstone, 35 miles eastward from Tucson, where a station has been established. This point is near a large mining district. A considerable traffic is reported as coming already to Tucson from the Mexican state of Sonora.

Texas papers state that this company's engineers have begun a survey of a line from San Antonio to El Paso. They are to be assisted by the engineer of the Galveston, Harrisburg & San Antonio road.

Tennessee State Railroad Bonds.—Argument in the test case on the lien of the bonds issued by the state of Tennessee on the railroads built in part by the proceeds of those bonds, was begun in the United States Circuit Court in Nashville, April 27. A large number of counsel are to be heard, and the argument will take some time.

Texas Trunk.—Over 200 men are now employed on the grading of this road between Dallas, Tex., and Kaufman. The engineers are now locating the line between Kaufman and Jacksonville. Track-laying is to be begun at Dallas soon.

Tonawanda Valley.—This company has been organized to build a railroad from Attica, N. Y., on the Erie south, by west to Sardonia Junction on the Buffalo, New York & Philadelphia. The distance is 23 miles, and most of the road was graded several years ago by the old Attica & Arcade Company.

Valley, of Ohio.—At the recent annual meeting the following statement was submitted for the year ending March 31:

Receipts from capital stock.....	\$8,364.52
From sale of first-mortgage bonds.....	1,016,206.11
Miscellaneous.....	6,300.79
Total.....	\$1,030,871.42

Paid on road and equipment.....	\$749,991.74
Supplies.....	2,580.30
Floating debt paid.....	226,867.47
Cash and receivables.....	51,482.91
Total.....	\$1,030,931.42

The road is now in operation from Cleveland to Canton 58 miles, and is said to be doing a very good business.

Washington & Ohio.—The Circuit Court at Richmond, Va., has given a decision declaring this company insolvent, and ordering a decree to issue for the sale of the road after 60 days' notice. Mr. McKenzie, President of the company, is allowed \$37,800 of Washington & Ohio railroad bonds as collateral for a debt of \$25,000. His claim for salary was not passed upon.

H. S. McComb and the contractors are to surrender the Alexandria, Loudon & Hampshire bonds, and take in lieu thereof Washington & Ohio bonds at 50 cents on the dollar as collateral for their debt of about \$280,000. The petition of J. H. Reid, Receiver of the Farmers' and Mechanics' Savings Bank of Alexandria, is rejected, on the ground that the money loaned was borrowed upon the faith of the company with bonds deposited as collateral.

Western Counties.—This road has been re-opened and trains began to run once more between Digby, N. S., and Yarmouth, on April 26. The connection between Digby and Annapolis is made by steamboat.

York Springs.—It is proposed to build a railroad from a point on the East Berlin Branch of the Hanover Junction, Hanover & Gettysburg road, northwest to York Springs, Pa., about 10 miles. It would connect with the Harrisburg & Potomac road.

ANNUAL REPORTS.

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Cape Fear & Yadkin Valley.

This company owns a line from the old town of Fayetteville, N. C., on the Cape Fear River, northwest to Gulf, 47 miles. Four miles of this, from Egypt to Gulf, were completed about the opening of the last fiscal year, which ended Feb. 29, 1880. Work is in progress on an extension from Gulf northwest through Greensboro to Mt. Airy in Surry

County, with a branch to the copper mines at Ore Knob. Until last year the road was known as the Western, of North Carolina, and locally called the Coalfields road, to distinguish it from the Western North Carolina.

The earnings and expenses for the year were as follows:

	1879-80.	1878-79.	Inc. or Dec.	P. c.
Gross earnings.....	\$32,222.98	\$30,512.49	I. \$1,710.49	5.6
Expenses.....	27,443.44	26,837.40	I. 606.04	2.3
Net earnings.....	\$4,779.54	\$3,675.09	I. \$1,104.45	30.1
Gross earn. per mile.....	985.00	709.59	D. 275.41	3.4
Net.....	101.69	85.47	I. 16.22	19.0
Per cent. of exps.....	85.17	87.96	D. 2.79	3.2

The report of the President, Mr. Julius A. Gray, says:

"At your last annual meeting an amendment to your charter, containing several important provisions, was adopted. Under it your corporate name has been changed and the control of the affairs of the company transferred from the private stockholders to the state. The capital stock has been scaled 50 per cent, and a consolidation with the Mt. Airy & Ore Knob Railroad Company effected.

"Another important privilege granted under this amendment was that of extending your road, by an 'independent line, up the valley of the Yadkin through the counties of Forsyth, Stokes, Yadkin, Surry and Wilkes to Patterson, in Caldwell County, thence through Caldwell, Watauga, Ashe, Allegheny or Mitchell, or either of them, and to connect with any railroad constructed or to be constructed in Western North Carolina.' Appreciating the inestimable value of such an extension to the material interests of the state of North Carolina, in the development of the immense resources of this magnificent valley of the Yadkin, and in the transportation of the rich and varied products of that fertile region through the entire length of the State to our own seaport at the mouth of the Cape Fear, you unanimously adopted a resolution inviting the cooperation of the people along this proposed line in carrying it forward to completion.

"At Ore Knob, the western terminus of our Mt. Airy Branch, 1,200 hands are now employed, and the product of their labor hauled for 45 miles in wagons to the nearest line of railway. Ours will, when completed, be 100 miles the shortest line to the sea, and can successfully compete for this traffic with any other which can be built."

Pensacola & Perdido.

This company owns a line 9 miles long from the wharf at Pensacola, Fla., to Perdido, or Millview, which is used chiefly for carrying lumber from the mills on the Perdido River. Its report for the year ending March 31, 1880, is presented in the following condensed form:

RECEIPTS.	
Passengers.....	\$1,339.07
Freight.....	37,310.51
Dock dues and ballast.....	1,753.80
Rents account.....	10.00
	\$40,414.07
DISBURSEMENTS.	
Bills payable, outstanding March 31, 1879.....	\$28,184.50
Individual liabilities, March 31, 1879.....	1,858.94
	\$30,043.44
Bills payable, March 31, 1880.....	\$24,015.80
Individual liabilities.....	2,372.44
	\$26,388.24
Collectable accounts, March 31, 1880.....	\$6,903.79
Collectable accounts, March 31, 1879.....	6,411.09
	\$492.70
Office expenses.....	\$250.00
Contingent expenses, taxes, etc.....	1,651.20
Salaries account.....	2,487.50
Repairs to locomotives.....	903.88
" " cars.....	609.04
Movement account.....	9,391.56
Road repairs.....	2,000.15
Wharf repairs.....	2,571.98
Damages paid.....	76.05
Car rent.....	1,280.50
Construction account.....	152.17
Equipment account.....	118.64
Interest account.....	8,333.17
Sinking fund.....	4,582.94
Freight expenses account.....	477.55
Profit and loss.....	400.84
	\$40,414.07

Actual earnings and expenses for the year:

	1879-80.	1878-79.	Inc. or Dec.	P. c.
Gross earnings.....	\$40,414.07	\$41,407.94	D. \$1,053.87	2.5
Expenses.....	22,593.36	22,041.38	I. 461.98	2.1
Total.....	\$17,820.71	\$19,366.56	D. \$1,545.85	7.8
Gross earn. per mile.....	4,490.45	4,607.55	D. 117.10	2.5
Net.....	1,990.08	2,158.51	D. 168.43	7.8
Per cent. of exps.....	55.68	53.11	I. 2.57	4.8

Increase of expenses due mainly to increase of wharf repairs of \$1,140.84 over previous year.

Milwaukee, Lake Shore & Western.

This company owns a line from Milwaukee, Wis., north and west to Norrie, 190 miles, with branches from Manitowish to Two Rivers, 6 miles, and from Hortonville to Oshkosh, 23 miles, making 219 miles in all. The main line from Tigerton to Norrie, 14 miles, and about half the Oshkosh Branch have been completed since the close of the year 1879; the average mileage for that year was 165 miles, and for the previous year about 150 miles. The following brief statements for the year have been published.

The stock and debt are as follows:

Common stock.....	\$1,000,000
Preferred stock.....	5,000,000
Total stock (\$27.397 per mile).....	\$6,000,000
Bonds (\$6.142 per mile).....	1,345,000
Other debt.....	118,000
Total.....	\$7,463,000
Cost of property (\$34.457 per mile).....	7,546,082

The present company was organized just at the close of 1875, by the bondholders who bought the road at foreclosure sale just previously. The present stock and bonds represent the bonded debt of the old company, with some issues made to pay for the 93 miles of new road built by the present company.

The earnings for the year were as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Gross earnings.....	\$315,942	\$250,130	I. \$65,812	26.3
Expenses.....	187,983	197,797	D. 9,814	5.0
Net earnings.....	\$127,959	\$52,333	I. \$75,626	144.6
Gross earn. per mile.....	1,915	1,608	I. 307	19.1
Net.....	776	340	I. 436	128.2
Per cent. of exps.....	59.51	79.12	D. 19.61	24.8

The net earnings were enough to pay interest on the total debt at 7 per cent., and leave a surplus of \$25,549.

A further extension is in progress, the line being intended

to run to Colby on the Wisconsin Central, forming part of a road across Wisconsin to St. Paul.

Paducah & Elizabethtown.

This company, which owns a line from Elizabethtown, Ky., westward to Paducah, 185.7 miles, makes the following statements for the year ending Jan. 31, 1880. The road was originally the Elizabethtown & Paducah, and afterward the Louisville, Paducah & Southwestern, and was acquired by the present company through foreclosure of mortgage.

The present company's securities represent the old debt, and consist of \$2,853,000, one-half common and one-half preferred; \$287,000 first mortgage bonds and \$1,141,200 second mortgage income bonds.

The earnings for the year were as follows:

	1879-80.	1878-79.	Inc. or Dec.	P. c.
Passage.....	\$71,071	\$77,321	D. \$6,250	8.1
Freight.....	258,704	219,178	I. 39,526	18.0
Mail, express, etc.....	22,004	23,042	D. 1,038	4.5
Total.....	\$351,779	\$319,541	I. \$32,238	10.3
Expenses.....	269,237	273,734	D. 4,497	1.6

Net earnings.....	\$83,232	\$45,807	I. \$37,425	81.7
Gross earn. per mile.....	1,808	1,230	I. 578	46.9
Net.....	448	246	I. 202	81.7
Per cent. of exps.....	76.38	85.06	D. 8.68	10.8

The road was incidentally benefited by the long continuance of low water in the Ohio last year, which prevented shipments of Pittsburgh coal down the river, and caused a greatly increased demand for coal from the mines on its line.

The income account for the year was as follows:

Balance, Feb. 1, 1879.....	\$ 34
Net earnings, as above.....	83,232
Total.....	\$83,266
Construction, equipment, right of way.....	\$4,305
Sundry accounts.....	4,750
Interest and sinking fund, first mortgage.....	28,431
	\$37,486
Balance.....	\$45,771
Interest on income bonds at 4 per cent.....	45,048
Balance, Feb. 1, 1880.....	\$123

The net earnings were thus just sufficient to make some improvements on the road and pay 4 per cent. to the holders of income bonds.

Worcester & Nashua.

This company owns a line from Worcester, Mass., to Nashua, N. H., 45.69 miles, and it leases the Nashua & Rochester, which extends the line to Rochester, 48.81 miles, making 94.50 miles worked. On the line owned there are 16.83 miles second track, and 13.79 miles of sidings. The report is for the year ending Sept. 30, 1879.

The equipment consists of 20 engines and 3 snow-plows; 3 parlor, 19 passenger, and 7 mail and baggage cars; 238 box, 100 platform, and 100 coal and gravel cars.

The general account is as follows:

Stock (\$39.173 per mile).....	\$1,789,800.00
Bonds (\$21.887 per mile).....	1,000,000.00
Bills accounts, and balances payable.....	56,882.06
Profit and loss.....	268,458.00
Total.....	\$3,115,140.06
Road and equipment (\$54.970 per mile).....	\$2,511,875.80
Nashua and Rochester stock.....	475,300.00
Materials.....	65,043.69
Cash and receivables.....	62,920.48
	\$3,115,140.06

Stock and bonds are unchanged; the floating debt was largely reduced. Cost of road and equipment reported decreased by \$14,689.85 during the year.

The work done was as follows:

	1879-79.	1877-78.	Inc. or Dec.	P. c.
Passenger.....	100,830	187,808	I. 87,000	8.7
Freight.....	183,559	155,147	I. 28,412	18.3
Other.....	32,038	35,877	D. 3,839	10.6
Total.....	416,427	378,832	I. 37,595	9.9
Passengers carried.....	322,925	325,977	D. 3,052	0.9
Passenger mileage.....	6,108,871	5,703,761	I. 405,110	8.2
Tons freight carried.....	382,163	313,962	I. 68,201	21.4
Tonnage mileage.....	12,123,444	9,931,740	I. 2,191,704	21.7
Av. train load.....	32.33	30.40	I. 1.93	6.3
Freight, tons.....	66.05	64.21	I. 1.84	2.9

The average rate per passenger per mile was 2.90 cents; per ton per mile, 2.10 cents on through, and 2.69 cents on local freight. Both passenger and freight rates show a decrease.

The earnings for the year were as follows:

	1879-80.	1878-79.	Inc. or Dec.	P. c.
Passengers.....	\$183,800.71	\$194,088.61	D. \$10,287.90	0.1
Freight.....	279,191.17	279,151.72	I. 39.45	0.0
Rents.....	6,653.69	6,638.42	I. 15.27	0.2
Dividends.....	14,259.00	28,518.00	D. 14,259.00	50.0
Total.....	\$483,904.48	\$508,396.75	D. \$24,492.27	5.0
Expenses.....	307,587.03	304,888.73	I. 2,698.30	0.9

Net earnings.....	\$186,400.85	\$203,508.02	D. \$17,107.17	8.4
Gross earn. per mile.....	5,227.45	5,379.86	D. 152.41	2.8
Net.....	1,972.56	2,153.52	D. 180.96	8.4
Per cent. of exps.....	62.26	59.97	I. 2.29	3.8

With a large gain in traffic the earnings were nearly stationary, the only change of any amount being in dividends received, and those are on the Nashua & Rochester stock owned, being really a rebate on rental. The expenses show a small increase. The result of the year was as follows:

Net earnings.....	\$186,400.85
Interest paid.....	\$60,965.62
Rent of Nashua & Rochester road.....	74,274.00
	\$135,240.02
Surplus for the year.....	\$51,137.23

This surplus has been used to pay notes of the company as they matured. During the year, it being apparent that the company's interest and rental liabilities were too great to be carried longer, action was taken, and an agreement finally made by which the interest on the bonds was reduced to 5 per cent., and the rental of the Nashua & Rochester to 5 per cent. on the bonds and 3 per cent. on the stock, to be restored to higher rates whenever the net earnings will warrant it. This has been agreed to by very nearly all the holders of securities; authorized by acts passed by the New Hampshire and the Massachusetts Legislatures, and ratified by the stockholders.

The report of the directors says: "The road-bed, tracks, bridges and rolling stock of the company have received all the care and attention required to keep them in good order and condition. Unless this is done no railroad can be operated with facility, safety and economy. Sooner or later expensive renewals and repairs will be required or the successful operations of the road impeded.

"The company has received for land taken by the city of Worcester for the location and construction of Foster street, \$15,500, and the proceeds have been applied to the payment of the floating debt, which has been reduced, during the year, \$60,641.78.

"The earnings of the Nashua & Rochester Railroad, in-

cluded in the gross earnings of the Worcester & Nashua Railroad, were:

Gross earnings.....	\$114,449.01
And the expenses, including repairs of road and use of rolling stock furnished by this company.....	63,615.42
Net income.....	\$50,833.59

"There seems to be a prevailing feeling in the community that business is beginning to improve, that the industries of the country are moving, that labor finds employment, and that the prospect for the future is brighter. If this should prove to be true and lasting there is no good reason why the business of this company should not also improve and share in the general prosperity of the country.

"Since the date covered by this report, Sept. 30, 1879, the substantial part (bills payable) of the floating debt of this company has been paid, principally from the proceeds received from the sale of old iron rails, and a strip of land sold to the Norwich & Worcester Railroad Company."

Naugatuck.

This company owns a line from Stratford, Conn., to Winsted, 57 miles, and its trains use the New York, New Haven & Hartford track from Stratford to Bridgeport, 4 miles. It works under agreement the Watertown & Waterbury road, 4 1/2 miles. The report is for the year ending Sept. 30.

The balance sheet is as follows:

Stock (\$35.088 per mile).....	\$2,000,000.00
Accounts payable.....	29,858.27
Profit and loss.....	309,230.75
Total.....	\$2,339,089.02
Road and equipment (\$37.501 per mile).....	\$2,137,570.32
Stocks and bonds.....	19,000.00
Real estate.....	35,412.70
Materials.....	41,472.24
Cash and accounts receivable.....	105,633.67
	\$2,339,089.02

The company has no bonded debt and no floating debt. The cash on hand is nearly double all accounts payable.

The train mileage for the year was as follows:

	1878-79.	1877-78.	Increase.	P. c.
Passenger.....	80,282	88,779	8,497	1.6
Freight.....	153,100	147,659	5,441	3.7
Switching and service.....	44,561	32,854	11,707	35.6
Total.....	287,948	269,292	18,656	6.9

This was equivalent last year to 2,198 round trips over the whole mileage worked.

The earnings for the year were as follows:

	1878-79.	1877-78.	Inc. or Dec.	P. c.
Passage.....	\$176,580.98	\$176,370.17	I. \$210.81	0.1
Freight.....	288,023.05	278,391.04	I. 9,632.01	7.1
Mail, express, etc.....	24,584.03	23,072.83	I. 1,511.20	6.5
Total.....	\$489,188.06	\$477,834.04	I. \$11,354.02	4.5
Expenses.....	298,650.47	280,063.68	I. 18,586.79	6.5

Net earnings.....	\$200,228.59	\$197,170.36	I. \$3,058.23	1.6
Gross earn. per mile.....	8,116.88	7,769.65	I. 347.23	4.5
Net.....	3,255.75	3,206.92	I. 48.83	1.5
Per cent. of exps.....	59.89	58.74	I. 1.15	2.0

Expenses include taxes, which were \$22,046.85 last year, or about 7 per cent. of the total expenses.

The income account was as follows:

Net earnings.....	\$200,228.59
Dividends, 10 per cent.....	200,000.00
Balance.....	\$228.59
Balance to credit of profit and loss, Sept. 30, 1878.....	300,002.16
Balance, Sept. 30, 1879.....	\$309,230.75

The company has paid 10 per cent. regularly for many years. The gross earnings show a large gain; the expenses increased with the increase of business and train-mileage, but the net earnings were sufficient to pay the usual dividends without drawing upon the accumulated surplus.

Housatonic.

This company owns a line from Bridgeport, Conn., to State Line, 74 miles; it leases the Berkshire road, from State Line to West Stockbridge, Mass., 22 miles; the West Stockbridge road, from West Stockbridge to State Line, N. Y., 2.75 miles; the Stockbridge & Pittsfield road, from Stockbridge, Mass., to Pittsfield, 22 miles, and the New York, Housatonic & Northern, from Brookfield Junction, Conn., to Danbury, 5.50 miles, making 52.25 miles leased and 126.25 miles worked, the whole forming a main line from Bridgeport to Pittsfield, with branches to Danbury and to the New York state line. The report is for the year ending Sept. 30.

The equipment consists of 20 engines; 22 passenger, 2 mail and smoking and 8 baggage cars; 191 box, 14 hay, 232 flat and 2 caboose cars; 1 wrecking car.

The general account is as follows:

Common stock, old.....	\$820,000.00
Preferred stock.....	1,180,000.00
Total stock (\$27.027 per mile).....	\$2,000,000.00
Bonds (\$7.432 per mile).....	550,000.00
Bills payable.....	148,050.00
Accounts and balances and October expenses.....	79,988.73
Profit and loss.....	172,143.93
Total.....	\$2,950,182.66
Road and property (\$37.816 per mile).....	\$2,708,401.24
Stockbridge & Pittsfield Co.....	5,062.76
Materials.....	53,128.85
Cash and receivables.....	92,650.81
	\$2,950,182.66

The bonded debt consists of three series of bonds, \$150,000 due in 1883, \$100,000 due in 1885, and \$300,000 in 1888.

The earnings were as follows:

The earnings were as follows:				
	1878-79.	1877-78.	Inc. or Dec.	P. c.
Passage.....	\$177,543.23	\$175,017.62	I. \$2,525.61	1.4
Freight and milk.....	397,681.41	370,421.17	I. 27,260.24	7.4
Mail, express, etc....	24,435.45	24,974.60	D. 539.24	2.2
Total.....	\$599,660.09	\$570,413.48	I. \$29,246.61	5.1
Expenses.....	349,815.27	350,472.36	D. 657.09	0.2